QST CANADA

Devoted entirely to Canadian Amateur Radio
Entièrement consacré à la radio amateur canadienne

Full-Wave Loop Antenna

IPARN

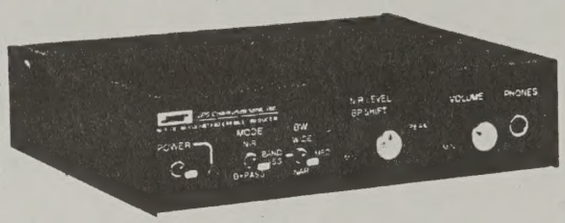
As World Turns DXAC

$2.50
December
décembre
1992

Canada Post Postage paid
Poste Canada Port payé
Third class
Troisième classe
10596

NOW! *DSP NOISE REDUCTION* at a *NEW LOWER PRICE !*

The NIR-10 provides reduction of white/pink noise, powerline noise, ignition noise, etc. from received audio. The unit also provides a spectral notch filter to remove multiple heterodynes, and a moveable bandpass filter mode, with selectable 250Hz, 600Hz, or 1800Hz SHARP filters. Premium Performance with Digital Signal Processing (DSP). 40MHz.



NIR-10: Was ~~$545.00~~ Now $499.95

If you only need to remove multiple heterodynes, use our NF-60 DSP Notch Filter, still only $199.95.
For 115VAC to 12VDC Adapter add $22. Charge to MC or Visa. Allow 1 week for personal checks. COD extra.

YAESU HF TRANSCEIVER

FT-747GX

For the amateur looking for a quality HF transceiver without spending a small fortune, the FT-747GX is excellent for mobile operation or, with a power supply, as a base station.

Reg. Price $890
SALE PRICE $799

Limited time special. Limited quantity!

- General coverage receiver from 100 kHz to 30 MHz.
- Clarifier, 20 dB attenuator, noise blanker & 500 Hz CW filter included.
- All modes: SSB, AM, CW, FM (with optional FM-747).
- Dual VFOs with selectable course and fine tuning steps.
- CAT system built in. 20 memory channels.
- 100 watts output.
- Internal fan with forced air cooling.

NORHAM RADIO INC.

Visit Our Retail Store, Phone or Mail Order
→ 4373 Steeles Ave. W., North York, ON M3N 1V7

Store Hours:
Monday–Friday: 10–6
Saturday: 10–3
Closed Sunday

(416) 667-1000
Fax 24-hours a day:
(416) 667-9995

• Experienced Advice • Competitive Pricing • Customer Satisfaction •

QST CANADA

QST Canada (ISSN 0840-1670) is published monthly by CRRL Publishing, Inc., to provide radio amateurs, others interested in radio communications and electronics, and the general public with information related to the science of Amateur Radio communications.

Staff

David Adams, VE3HBF
R.R.#1, Sutton West, ON L0E 1R0
Tel (416) 478-2131, Fax (416) 478-8163
Editor

Bob Boyd, VE3SV, Dana Shtun, VE3DSS, Ray Staines, VE3ZJ, Ken Oelke, VE6AFO, Ernie Poole, VE3NSZ
Contributing Editors

Ray Staines, VE3ZJ
General Manager

Keith Bentley, VE3DHL
148 Donhill Cr, Box 96
Kleinburg, ON L0J 1C0, Tel (416) 893-1984
Advertising Manager

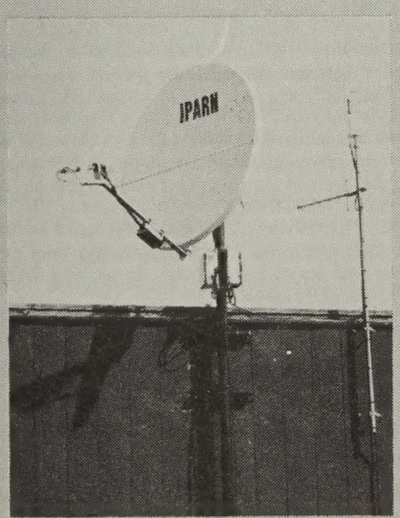
Harry MacLean, VE3GRO
Production Assistance
LaserGraphics
Linotronic Output
WEBCO Division of Bowes Publishers, Ltd
Printing and Distribution

CRRL Office

2025 Richmond Street
Box 56
Arva, ON N0M 1C0
(519) 660-1200, Fax (519) 660-8244

Subscription rates: CRRL membership with QST Canada: $15 + $12 + $0.84 GST = $27.84 per year. CRRL membership with QST and QST Canada: $15 + $43 + $3.01 GST = $61.01 per year. Two- and three-year subscriptions are available at multiples of the yearly rates. Copyright © 1992 by CRRL Publishing, Inc.

ABOUT THE COVER



The Inter-Provincial Amateur Radi Network (IPARN) Ontario earth station with UHF Yagi for links to local terrestrial networks. *(VE3NGT photo)* ■

It Seems to Us.../Il nous semble...

Local Clubs...the Ties that Bind Us

Most of you belong to one. It's where you meet and get to know your fellow amateurs face to face. It's where many of you learned how to pass the tests that brought you into this absorbing hobby. Above all, it's where you experience first hand the "spirit of Amateur Radio" with an outstretched hand always ready to help you technically, physically or personally.

Some of you, for one reason or another, may not be able to attend club meetings to enjoy the socializing or the learning from guest speakers. For those of you in this situation, the club newsletter or magazine fulfills a key role in keeping you in touch.

Club Newsletters

These newsletters and magazines vary a great deal. The most important thing is the information they contain about the club, its activities and its members, as well as the more general material reflecting Amateur Radio interests.

Very important too is the way all this is presented. The *ARNS Bulletin* is a monthly publication of the Amateur Radio News Service (ARNS), an organization for Amateur Radio newsletter editors that helps them improve their publications and promote Amateur Radio. There are articles of advice on writing editorials, technical articles on use of programs like Pagemaker, and suggestions on how to get people to read your paper.

ARNS runs an annual publication contest open to all Amateur Radio organizations. This is a valuable opportunity for clubs, providing them with a detailed evaluation of their newsletters by a panel of experienced judges. Each judge rates the newsletters on a host of criteria including editorial balance, quality of writing, grammar, technical, humour, coverage of club events and much more.

A glance over the many club papers received by CRRL shows a generally high standard. With sometimes limited resources, both human and technical, newsletter editors do a good job of informing and helping to hold a club together. But there are a few areas in which an ARNS evaluation might bring about some improvements.

Some club papers do not identify themselves properly or date their issues clearly. Some fail to list their officers or spell out their conditions of membership. A number apparently have trouble getting enough input from their members, creating a tough job for the editor. But they all help to hold their clubs together and provide the friendly "ties that bind us". *—David Adams, VE3HBF* ■

Federal Minister of Communications Perrin Beatty addresses radio amateurs across Canada via the IPARN network during Field Day, 1992 June 29. In the back, from left to right, Jim Cummings, VE3XJ (DOC), Ray Perrin, VE3FN (CRRL), and Dan Holmes VE3EBI (CARF). *(DOC photo)*

Letters/Lettres

Conducted by David Adams, VE3HBF

All letters are considered carefully. Letters are edited for clarity and may be condensed in order to have more information and readers' views presented. The publishers of *QST Canada* assume no responsibility for statements made by correspondents.

DON'T ALLOW SHIPBOARD QSOs FOR DXCC

The Breton DX Group (VE1DXX) of Sydney, Nova Scotia, has urged the ARRL DX Advisory Committee (DXAC) *not* to allow relaxation of the rule prohibiting contacts with ships and boats, anchored or under way, from counting towards DXCC.

In a letter to the DXAC Chairman, the group asked ARRL to maintain the "integrity and pre-eminence of the DXCC Award", pointing out that part of its distinction is that it is not easy to get.

"Getting to within sight of a rare DXCC island country or even tying up to the dock is not 'being there'. In our view, allowing DXCC credit for shipboard operation makes things too easy. It also opens a veritable Pandora's Box of potential problems and controversy. How close does the operation have to get to the island to be valid? Does the boat only have to be in territorial waters? What defines territorial waters? Three, 12, 200 miles?

"There is also the question of licensing of Maritime Mobile stations. There might be no need for an official licence from the stated 'country' for a shipboard operation. How would the DXAC determine legitimacy if no official document existed giving permission to operate from the 'country'?" —*Jack Columbus, VE1XT, Sydney, NS* ■

As the World Turns—continued from page 9

remains unchanged. Only more detail has been provided with respect to the political and distance questions.

Am I surprised at the recent decisions of the DXAC? No! Do I agree? Yes! The DXCC Countries List may function by recognizable rules, as well as some not so easily understood. Is this a problem? No! Hugh Cassidy, WA6AUD, of *West Coast DX Bulletin* fame would say, "This DX enigma will be revealed to those that believe, in the fullness of time." Professor Cass would also say, "DX Is!"

Season's Greetings and Good DX! ■

VHF-UHF—continued from page 14

cavities using the venerable water-cooled 2C39. Once Dick gets his amplifier finished, look for some very loud signals from Toronto.

1296 MHz: Clarke, VE3WCB, reports good activity on 23 cm during the September contest. Contacts included W2SZ/1 (FN32), WA2TLM (FN20), and W4IY (FM08). Clarke is indeed happy with that DX! Meanwhile, Dick, VE3FAC, had a close one with KC4YO on September 16. The Tennessee station (EM75) was 20 over 9 on 144 and 432 MHz. Moving up to 1296 MHz found KC4YO copying VE3FAC solid, but Dick could not hear KC4YO! Dick runs 200 watts and four loop yagis, KC4YO was running ten watts and two loopers.

Meanwhile, during the September contest, Dick reports working AF9Y (EN52) near Chicago, a good long haul for 23 cm! Look for more from Dick in the spring tropo.

Microwaves: According to ARRL, WB5LUA and W9ZIH set a new DX record on 3456 MHz, spanning 736 miles between Allen, Texas and Malta, Illinois. Roger, VE3RKS, sent us a copy of his 10-GHz Cumulative Contest logs for 1992. Roger runs a homebrew wideband FM system: five milliwatts to a 25-inch dish borrowed from Steve, VE3SMA. I'm not sure if it was the dish on the cover of our November issue or not, hi. Contacts included VE3MNA, VE3EZP, VE3SMA, VE3TJD, VE3OIK, VE3PFC, and VE3OCY. I did speak to Steve prior to the contest, and it sounded as if they were really going for gold during the weekend. By the way, Roger's best DX was 74.9 kilometres.

JANUARY ARRL VHF SWEEPSTAKES

Don't forget to scrape the ice off the antennas, send the family to the Caribbean for the weekend, and get in on this annual VHF contest, 1993 January 16–18. Send one copy of your log to ARRL, 225 Main Street, Newington, CT 06111, and another copy of your log to Dana Shtun, VE3DSS, 500 Willard Avenue, Toronto, ON M6S 3R6. We will then tabulate the scores for the Toronto VHF Society certificates.

That's it for now. Remember that this is *your* column. We appreciate construction notes and commentary as well as VHF/UHF activity reports. With RAC, we anticipate appearing in *TCA* shortly, and we plan to conduct a big push for VHF/UHF in 1993. So give us a call or drop us a line. Season's Greetings. Best Wishes for the New Year. —*Dana Shtun, VE3DSS, CRRL President* ■

The Canadian Radio Relay League, Inc
La Ligue Canadienne de la Radio Amateur, Inc

The Canadian Radio Relay League (CRRL) is a noncommercial association of radio amateurs organized for the promotion of Amateur Radio communications and experimentation, for the establishment of networks to provide communications in the event of disasters or other emergencies, for the advancement of the radio art and the public welfare, for the representation of radio amateurs in legislative and other matters, and for the maintenance of fraternalism and a high standard of conduct.

CRRL is incorporated under the Canada Corporations Act. Its affairs are governed by a seven-member Board of Directors elected every two years by the CRRL general membership. CRRL is noncommercial, and no one who could gain financially by the shaping of its affairs is eligible for membership on its Board.

CRRL is the Canadian member-society of the International Amateur Radio Union (IARU). "Of, by and for the Canadian Radio Amateur", CRRL numbers within its ranks the vast majority of active amateurs in the nation and has a proud history of achievement in amateur affairs.

A bona fide interest in Amateur Radio is the only essential requirement for membership. An Amateur Radio licence is not required, although full voting membership is granted only to licensed amateurs in Canada.

Membership inquiries and general correspondence should be directed to CRRL Headquarters, Box 56, Arva, ON N0M 1C0 Tel (519) 660-1200.

Officers

President: Dana Shtun, VE3DSS
500 Willard Ave, Toronto, ON M6S 3R6
(416) 763-1761
Honorary Vice Presidents:
Thomas Atkins, VE3CDM
Noel Eaton, VE3CJ
Vice President: Timothy Ellam, VE6SH
Suite 3300, 421 7 Avenue SW, Calgary, AB
T2P 3S8 (403) 260-3533
Vice Pres Int'l Affairs: George Spencer, VE3AGS
R R 1, Jordan, ON L0R 1S0
(416) 562-4891
Secretary-Treasurer: William Loucks, VE3AR
155 Brentwood Rd N, Toronto, ON M8X 2C8
(416) 231-8474

Directors

Alberta Director: Ken Oelke, VE6AFO*
7136 Temple Dr NE, Calgary, AB T1Y 4E7
(403) 280-5340
Atlantic Director: Carl Anderson, VE1UU*
25 Lawnsdale Dr, Dartmouth, NS B3A 2N1
(902) 469-9756
Quebec Director: Larry Dobby, VE2DO*
157 Sedgefield, Point-Claire, PQ H9R 1N8
(514) 695-3528
Ontario North Director: Raymond Perrin, VE3FN*
131 Acacia Ave, Ottawa, ON K1M 0R2
(613) 747-1173
Ontario South Director: George Gorsline, VE3YV*
118 MacPherson Ave, Toronto, ON M5R 1W8
(416) 921-4214
Midwest Director: Dave Snydal, VE4XN*
25 Queens Cr, Brandon, MB R7B 1G1
(204) 728-2463
Pacific Director: David Fancy, VE7EWI*
14455 104A Ave, Surrey, BC V3R 1R2
(604) 584-6517

Section Managers

Alberta: Don Wilcox, VE6CG
940 Marpole Rd NE, Calgary, AB T2A 4E3
(403) 248-5614
British Columbia: Ernest Savage, VE7FB
4553 West 12th Ave, Vancouver, BC V6R 2R4
(604) 224-5226
Manitoba: William G Crooks, VE4JR
431 Hillary Cr, Winnipeg, MB R2Y 0Z1
(204) 837-9509
Maritimes-Newfoundland: Carl Anderson, VE1UU
25 Lawnsdale Dr, Dartmouth, NS B3A 2N1
(902) 469-9756
Ontario: Larry Thivierge, VE3GT
34 Bruce St W, Renfrew, ON K7V 3W1
(613) 432-5967
Quebec: Joe Unsworth, VE2ALE
163 Mgr Bourget, Vaudreuil, PQ J7V 2W4
(514) 455-2448
Saskatchewan: Joan Lloyd, VE5JML
1655 Garnet Street, Regina, SK S4T 2Z1
(306) 525-2605

Staff

General Manager: Raymond Staines, VE3ZJ
Field Services Manager: Ken Oelke, VE6AFO
7136 Temple Dr NE, Calgary, AB T1Y 4E7
(403) 280-5340
Awards Manager: David Noon, VE3IAE
19 Honeysuckle Cr, London, ON N5Y 4P3
(519) 453-2292
Central Incoming QSL Bureau Manager:
Don Welling, VE1WF
Box 51, Saint John, NB E2L 3X1
Outgoing QSL Bureau Manager:
John Henderson, VE3HFT
Box 56, Arva, ON N0M 1C0
General Counsel: Timothy S Ellam, VE6SH
Suite 3300, 421 7 Avenue SW, Calgary, AB T2P 3S8
(403) 260-3533
Honorary Counsel: B Robert Benson, QC, VE2VW

*Voting member, CRRL Board of Directors

IPARN: The Inter–Provincial Amateur Radio Network

East meets west—22,000 miles above the equator!

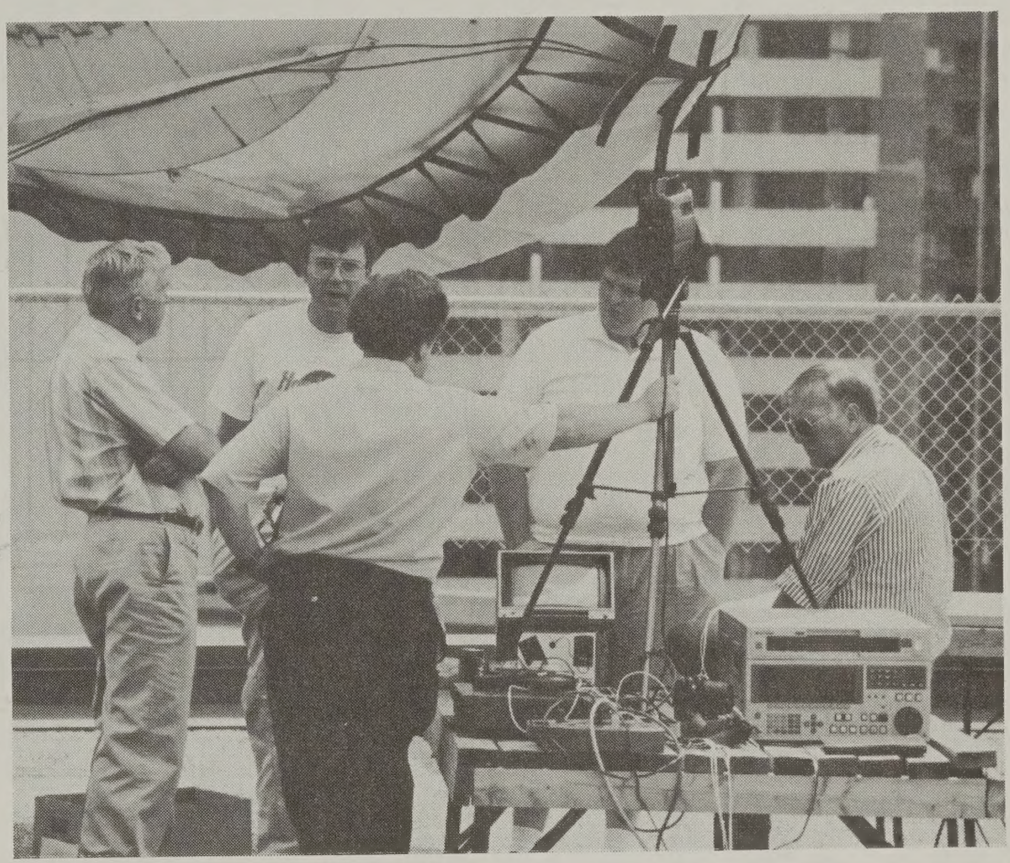
By Adrian Stimpson, VE7CGL
12259 206 Street
Maple Ridge, BC V2X 1T8

Remember the first time you sent CQ in Morse code and heard your callsign coming back over the crackle of the air waves? How about your first QSO on your local VHF repeater? Or the first time you provided emergency communications for someone in distress?

These are all magic moments in your life as an amateur. When you first get your licence everything is intriguing, different, a new experience. After a while these things become second nature. If we are not careful, the "experimenter" part of Amateur Radio can be forgotten, leaving only a "radio operator". Before you know it, you are no longer having fun with Amateur Radio. This is particularly true for operators of VHF/UHF FM where you don't have the mysterious variables of the ionosphere to make each day's activity a little unpredictable.

This is the story of how a group of amateurs got back into the "experimenter mode", culminating in what was once unthinkable: handheld-to-handheld communications across Canada.

Throughout the late 70s and early 80s, amateurs on the VHF bands decided to expand the range of their repeaters through linking. This was soon enhanced to a more sophisticated topology using "trunks" and hubs to allow full-mesh networking over large-coverage areas. Networks began to grow throughout Canada, allowing amateurs to communicate over hundreds of miles from their local repeater. Human nature makes us strive for new goals as soon as previous ones are attained. This was the case for many amateurs who hungered to cover greater and greater distances with the networks. Meetings were held and talk began of a single network covering the four western provinces. It became clear that there were some physical limitations to be dealt with. Depending on the accessibility of repeater sites, a failure might mean loss of communication between entire sections of the network. Indeed, many repeater sites in British Columbia and Alberta are inaccessible throughout the winter months.



Official IPARN opening net on roof of CTV Headquarters, Toronto. From left to right: Al Vanderburgh, VE3ARV (TFMCS); IPARN Secretary Adrian Stimpson, VE7CGL; Terry Darling, VE3CAB (ULRRA); Randy Neals, VE3RWN, and IPARN President Bill Blake, VE7CQ.

At this point it would have been easy to accept this limitation and forget our "experimenter role". Thanks to some creative thinking, a group of people got together around the coffee pot one night in Langley, British Columbia, and approached the problem. They emerged with the name for a new organization: "IPARN—the Inter–Provincial Amateur Radio Network"—and a solution to the problem: satellites.

That's right. If you used a geostationary satellite as a Canada-wide "hub repeater", networks could be joined from all regions, and a failure in one network would not impact on the others. Perfect! Additional benefits became readily apparent. A satellite network could be used for packet forwarding, a variety of nationwide nets, emergency communications, and bringing amateurs in small northern communities with just one or two repeaters into contact with thousands of fellow amateurs in the south.

There have been many milestones reached since that late night session in Langley. First, IPARN registered as a non-profit society, and then secured a dedicated satellite channel exclusively for amateur use from Telesat Canada, the operators of the Anik satellites. Then some satellite equipment was built and tested during a "proof-of-concept" test which was held in January, 1990. During this test, amateurs in Alberta and British Columbia had the opportunity to speak to each other using nothing more than handheld radios and their local repeaters. Activity was almost non-stop, and due to strong membership support, the connection returned to become permanent in

June, 1990—just five months later.

Then, on June 14, 1992, it happened: after a lot of planning and hard work, the first handheld-to-handheld QSO between a VE3 and a VE7 took place. Casey Coley, VE3NGT, IPARN's Toronto Regional Coordinator, spoke with Don Auld, VE7FKX in Vancouver, their voices travelling over 45,000 miles through space. IPARN was now operational in Ontario! An opening net took place at noon EDT with guest speakers on the roof of CTV Headquarters in Toronto and check-ins from British Columbia, Alberta and southern Ontario.

The work that enabled all this to happen should not go unrecognized. The essential ingredient was cooperation. The people of the Toronto FM Communications Society (TFMCS) and VE3ULR Repeater Association (ULRRA) deserve much credit for their work in building two of the best networks in Ontario. The leadership shown by Terry Darling, VE3CAB, and Al "Van" Vanderbergh, VE3ARV, in adapting their networks to communicate through a common IPARN hub was a perfect example of the cooperation that made the project possible. Terry and Van were well supported by a team that included John, VE3POJ; Randy, VE3RWN; Chuck, VE3HHZ, and Harold, VE3WHO. Everyone jumped into the project with their area of expertise and became an important contributor to the success of the installation.

A special mention should go to Don, VE7FKX, who developed IPARN's measurement and control system (MACS). MACS represents the culmination of many years of work, and Ontario is the first IPARN site to have a MACS module installed. (There are now plans to retrofit the Alberta and BC terminals with MACS controllers as soon as Don has recovered from the round-the-clock work he did on the Ontario MACS boards.)

MACS provides complete control over the satellite-earth-station and terrestrial-network interface, handling seamless network configurations via DTMF translations and regeneration. Details of the functions that the MACS perform could fill pages, but in short, Don's work has made it easy for anyone to use the network. Users simply enter the DTMF code for the repeater they wish to reach and MACS looks after everything, negating the need for complicated network maps and multiple DTMF sequences. This will be invaluable when the network grows to include every Canadian province and territory.

For many people, the excitement of having Ontario on the IPARN network has rekindled the enthusiasm they had for Amateur Radio when they first got their licence. Since June 14, many friendships have been made, and many informative nets and special events have been held, events like the address given by the Minister of Communications during Field Day, and communications with underwater divers on Canada's west coast.

This is only the beginning of this new dimension of Amateur Radio. As amateurs, we must continue to expand the network to new regions and include new applications. IPARN's goal is a *nationwide* network. This will not be completed until every province and territory has a satellite terminal. At the same time, there are plans for mobile earth stations for emergency communications, a Canada-wide packet channel, additional voice channels to handle busy periods, and much more. Even the idea of international communications has been suggested by some network users.

The enthusiasm with which IPARN members embrace these concepts is very encouraging. Letters from members are received from all over Canada. Some have been members since IPARN was founded in 1989, and although they may not yet have an earth station in their province, they enjoy following the project through updates in IPARN's regular publication, *Network*. Of course, the key to IPARN expanding into new regions is membership support.

IPARN would like to thank everyone who contributed to the expansion into Ontario. We look forward to continued support from around the country as we plan the next phase of expansion. There are many things that Amateur Radio has to offer. We hope that we have shown the amateurs of Canada that "the sky is no longer the limit".

For more information about IPARN or IPARN membership, please write to Box 3156, Langley, BC V3A 4R5. ■

Join IPARN Today!

- *The Inter-Provincial Amateur Radio Network's objective is to expand into every Canadian province and territory. Membership support is the key to making this happen.*
- *As a new member, you will receive an operating guidebook and DTMF access codes. You will also receive IPARN's popular publication, Network, every other month.*
- *Membership is just $36 for one year, $95 for three years and $150 for five years. To join, send your name, call sign, and cheque or money order to IPARN, Department 9212, Box 3156, Langley, BC V3A 4R5.*

IPARN—Canada's National Network...

Ham-Ads

Advertisements must pertain to Amateur Radio. For individuals or firms offering products or services for sale, the rate is $0.50 a word + GST. This is reduced to $0.25 per word + GST for those seeking to dispose of or acquire personal station equipment. Telephone numbers count as one word. No charge for postal codes. Unless specified, a *QST Canada* Ham-Ad will appear in the next available issue. Send Ham-Ads to CRRL, Box 56, Arva, ON N0M 1C0.

WANTED: Old Marconi wireless telegraph keys. Murray Willer, VE3FRX, 557 Spadina Road, Toronto, ON M5P 2W9.

WANTED: Old QSTs and AM spoken here. Please don't dump your "boat anchors"! I actually use them on the air, and appreciate them! Write to Peter Swynar, VE3CUI, R. R. 8, Newcastle, ON L1R 1L9.

KENWOOD

FM DUAL BANDER

TH-78A

IN COMMAND

Kenwood's New FM Dual Bander Sets the Pace

One glance at ergonomic design of Kenwood's TH-78A is enough to tell you that this is far from an ordinary handheld transceiver. You're looking at the smallest dual bander in the world, packed with the finest communications technology: bult-in DTSS and paging functions, alphanumeric memory and message paging, dual-frequency receive (including VHF+VHF & UHF+UHF) and double-band scan. Plus much more. Compact and confident, the TH-78A is truly going places.

• Built-in DTSS & paging functions • Alphanumeric memory functions (max. 6 characters) • Alphanumeric message paging (max. 6 characters) • Dual-frequency receive • Dual encoder • Full-duplex cross-band operation • ABC (automatic band change) • Double-band scan • 51 non-volatile memory channels, optionally expandable to 250 channels with optional ME-1 • 4-position output power control (High/Mid/Low/Economy low) • CTCSS operation with TSU-7 tone decoder (opt.) • Sliding keypad cover • Auto power-off • Auto battery saver • 10-minute time-out timer (TOT)

N E W

Smallest Dual-Band Transceiver in the World

KENWOOD ELECTRONICS CANADA INC.
6070 Kestrel Road, Mississauga, Ontario, Canada L5T 1S8
Telephone: 416 670 7211, Facsimile: 416 670 7248

PRODUITS ELECTRONIQUES ELKEL Ltee.®

2435 BL. DES RECOLLETS TROIS-RIVIERES QC. G8Z 4G1
TEL (819) 378-5457 FAX (819) 378-0269
LUNDI FERME Mardi-Mercredi-Jeudi (10h-17h) Vendredi (10h-21h) Samedi (10h-15h)

YAESU

HF.		LISTE	ELKEL
FT-1000D	.500-30MHz	$5 372.00	$4 499.00
FT-1000	.500-30MHz	$4 079.00	$3 489.00
FT-990	.500-30MHz	$2 718.00	$2 449.00
FT-990DC	.500-30MHz	$2 419.00	$2 059.00
FT-890AT	.500-30MHz	$1 759.00	$1 539.00
FT-890	.500-30MHz	$1 559.00	$1 369.00
FT-767GX	.500-30MHz	$2 448.00	$2 139.00
FT-747GX	.500-30MHz	$ 999.00	$ 929.00
BASES STATION			
FT-736R	2m/70cm	$2 308.00	$1 999.00
MOBILES			
FT-290R/II	2m	$ 737.00	$ 669.00
FT-2400H	2m	$ 474.00	$ 449.00
FT-7400	70cm	$ 494.00	$ 469.00
FT-5100/B8	2m/70cm	$ 839.00	$ 729.00
FT-5200/B8	2m/70cm	$ 889.00	$ 779.00
HANDHELDS			
FT-411E	2m	$ 421.00	$ 359.00
FT-415/25	2m	$ 491.00	$ 419.00
FT-470	2m/70cm	$ 567.00	$ 479.00
FT-530	2m/70cm	$ 599.00	$ 549.00

YAESU

FT-2400H

Prices Subject to Change Without Notice / Authorized Dealer

15 DECEMBRE 1992

HF Full-wave Loop Antennas

By Paul M. Dunphy, VE1UK
3351 Highway 7
Lake Echo, NS B0J 2S0

Amateurs have been using loop antennas for over fifty years. A loop antenna is just that—a closed loop of wire. Practical transmitting loops must be at least a full wavelength around. Smaller designs are inefficient and hard to feed. There are two basic types of loops commonly used by amateurs: the full-wave quad and the full-wave delta loop. (Actually, a folded dipole is a full-wave loop, but it does not share many of the properties of the quads and deltas).

Loop antennas offer several advantages when compared to half-wave dipoles. Loops exhibit a wider bandwidth. They tend to be quieter—they have a a better signal-to-noise ratio. An ideal loop has about 2 dB of gain over a dipole. Even when they are mounted close to the ground they can have a very low angle of radiation. Depending on the design, this angle can be as low as 20°. This 20-degree configuration is of particular interest to DXers because it can extend the first skip zone to over 1500 kilometres. On the other hand, loops are a bit harder to match than half-wave dipoles when fed with coax. They are also larger and are more prone to weather damage. Low-band loops, particularly for 160 metres, are difficult to construct because of their size. A 1.8-MHz vertically mounted loop would require supports in the order of 45 metres!

In this discussion we will deal primarily with single-element antennas. One or more parasitic elements can be added to either quad or delta loops. This will give the antenna gain and directive characteristics similar to that of a traditional beam. Such configurations exhibit forward gain, front-to-back ratios and side rejection that is usually better than a comparable yagi. Unfortunately, however, multi-element loops require constant maintenance because of the wind and ice associated with winters in the northern latitudes.

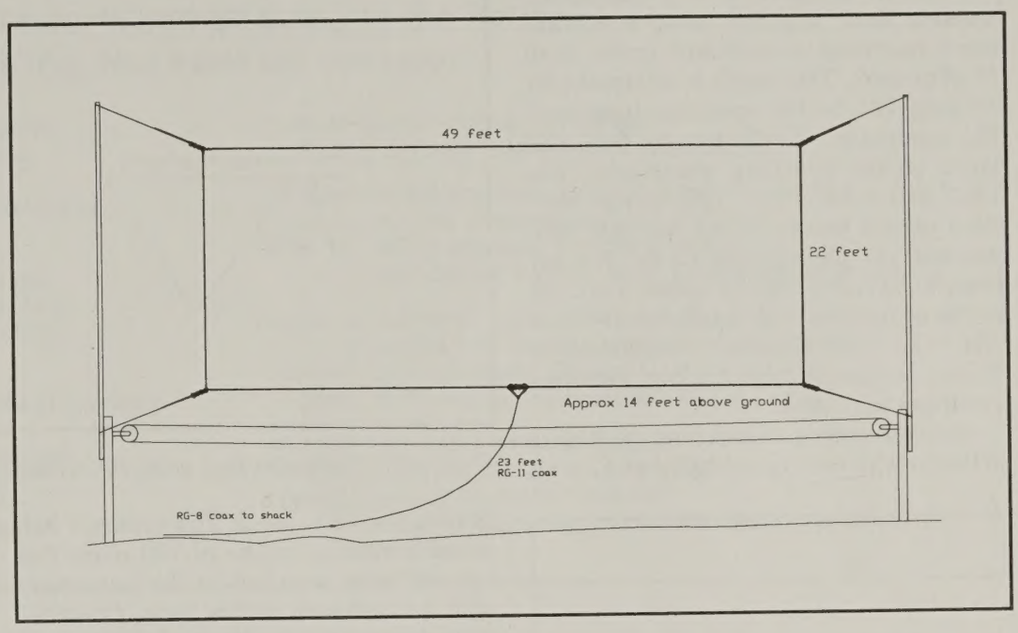


Fig 1—40-metre quad located at VE1UK.

Quads vs Delta Loops

The ideal loop antenna is a perfect circle. This cannot easily be constructed for HF operation. A circular loop requires the conductor to be a rigid material such as tubing, or a wire with an infinite number of supports. Even for ten metres, this would not benot practical, because the loop would be about 35 feet in circumference and 11 feet in diameter.

Fortunately, the loop can be constructed as a square or triangle with only a small loss in performance. Square loops are known as quads, and the triangle configuration is called a delta loop. The quad has about 0.5 dB gain over the delta loop. This is because the wire angles on the triangle are sharper. Near the corners, the sides of a delta loop are closer than the sides of a quad and energy cancellation is increased. It is important that all three sides of a delta loop be the same length, to minimize this effect.

Quad antennas are a little harder to construct because they require more supports. They only real advantage is the theoretical 0.5 dB of gain over the delta loop. Many amateurs, especially DXers looking for every bit of gain possible, choose the quad for exactly this reason. The author has used delta loops for 10, 12 and 17 metres and is now using a quad for 40. Both configurations perform well. In the author's opinion, ease of construction gives a slight advantage to the delta loop.

Both quads and delta loops are bi-directional, similar to dipoles. Their main radiation lobes are broadside to the plane of the loop. They have very strong nulls off the edges, more pronounced than those off the ends of dipoles.

Construction

Both quads and delta loops are cut to the same length. The number 1005 divided by the operating frequency in MHz gives the length in feet. In contrast to a straight wire antenna, this is longer than two half wavelengths. An 80-metre loop, cut for CW at 3.5 MHz would be about 278 feet. Loops are not as susceptible as dipoles to interaction with surrounding objects. They can also be mounted closer to the ground before a capacitive effect causes a significant shift in the resonance point. Nonetheless, do not expect to cut a loop using the formula and have it resonate at exactly the desired frequency. As with all antennas, it should be cut a little longer to allow for tuning.

As mentioned above, delta loops should be equilateral triangles. Quads should be as square as possible. Rectangular quads perform well provided the shape is not too distorted. If you build a rectangular quad, make sure the parallel sides are the same length. The *ARRL Antenna Book* warns that a rectangular quad may take on the characteristics of a folded dipole if the vertical sides become too short.

All antennas perform better as you get them higher into the air. Loops are no exception. However, in many cases, lack of towers or other tall supporting structures mean that the loop must be mounted relatively close to the ground. The *ARRL Antenna Handbook* describes a 40-metre quad loop that is only 7 feet off the ground. The vertical sections are 27 feet long. The horizontal ones are 44 feet. The author has built one similar to the ARRL design except that it is about 14 feet above ground and it is a slightly more pronounced rectangle. This antenna resonates at 7.080 MHz and performs exceptionally well. The VSWR is 1:1 at resonance. At 7.000 MHz the VSWR is 1.2:1. It reaches 2:1 at 7.300 MHz, allowing

almost full use of the 40-metre band with this single antenna. See Fig 1.

Feedline Matching

Full-wave loop antennas have a characteristic impedance of about 100 ohms. When a loop is fed with 52-ohm coax such as RG-58 or RG-8, the best VSWR that can be achieved is 2:1. The *ARRL Antenna Book* suggests using a quarter-wave matching transformer made from 75-ohm coax. The length is computed by dividing 246 by the operating frequency. The antenna at VE1UK was cut for 7.080 MHz, so the matching transformer was 246/7.080 = 34.75 feet. This was an electrical quarter wave, but we had not compensated for the velocity factor. For my foam RG-11, the velocity factor was 0.66, so the actual physical length was 34.75 x 0.66 = 22.9 feet. This was rounded off to 23 feet, and as mentioned above, provided a near-perfect match.

Another method of matching the loop is to feed it with two equal lengths of 52-ohm coax as shown in Fig 2. This creates a balanced transmission line of 100 ohms that can easily be matched to the transceiver with a transmatch. In his book, *Practical Wire Antennas,* John Heys, G3BDQ, suggests this as a method of avoiding matching transformers or tuning stubs.

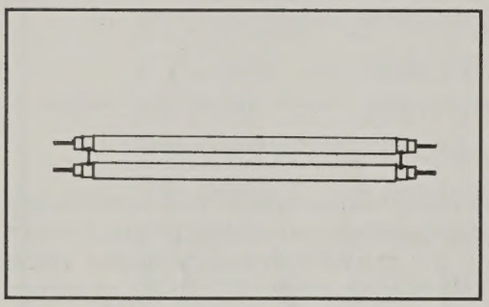


Fig 2—Two lengths of 52-ohm coax are used to make a 100-ohm balanced feed.

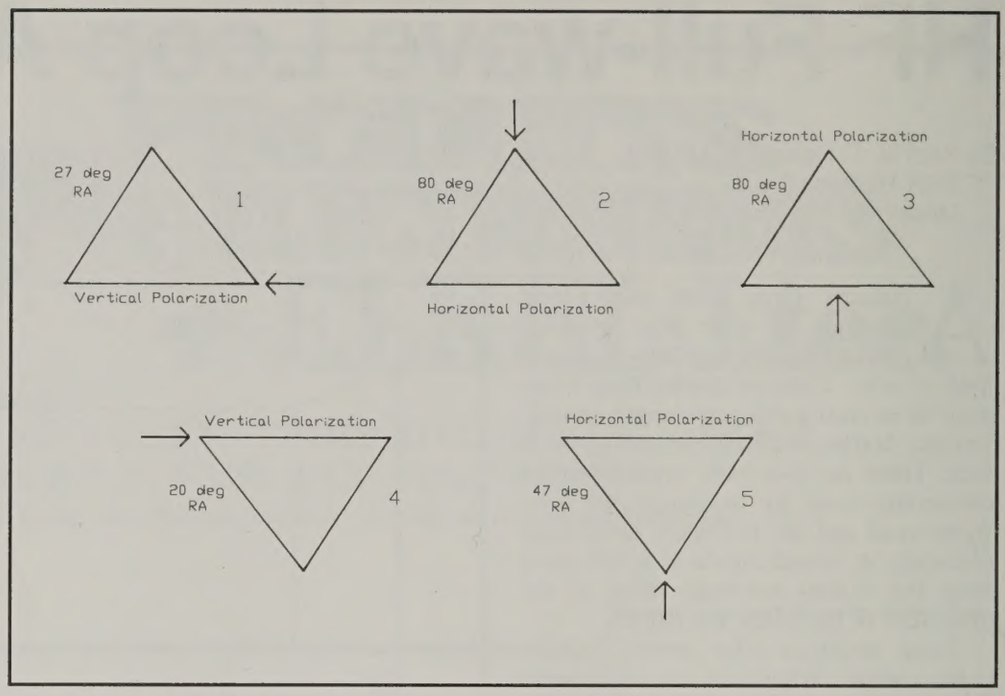


Fig 3—Arrow indicates feed point, RA is radiation angle of main lobe.

Polarization and Radiation Angle

Both polarization and the angle of radiation can be controlled by a loop's design. Fig 3 shows five combinations of orientation and feed points for delta loops. The feed point is assumed to be matched by either a balanced feedline or a coax transformer. As the diagram shows, there can be profound differences. Clearly the DXer will choose configuration 4 because it provides both vertical polarization and a low angle of radiation. Amateurs wishing to participate in short haul QSOs and local traffic nets will choose configuration 2 or 3, whichever is easier to construct. Configuration 5 is a compromise giving an acceptable DX radiation angle while retaining horizontal polarization. ■

Great Radio Amateurs of the Past...

"GOOD KING WENCESLAS"

...By Stan Simpson, G4ITM

Good King Wenceslas looked round
To check his installation.
He saw his dipole on the ground
Which caused him consternation.

"Hither page, come stand by me.
Just pull aside the curtain.
And you will see the 5RV
Gone for a Royal Burton.

Bring some tools and bring some wine
And make your heart feel gladder.
For you will climb the prickly pine
And I shall hold the ladder."

Page and monarch faced the storm
To deal with this disaster.
The page was keeping himself warm
By carrying his master.

"Sire, the tree seems higher now
And my hands grow colder.
Please cover up thy royal brow,
For I have dropped the solder."

"Mark my words, O careless page,
Don't act with bad intention.
Or thou shalt find thy monarch's rage
Reflected in thy pension."

One of a series by Stan Simpson, G4ITM, reproduced from VITAL SPARK, journal of HERC, Hastings Electronics and Radio Club, England

"Sire, I feel much warmer now,
That you are transmitting.
Thy kilowatt ignites the bough
On which I was just sitting."

Page and monarch to the shack—
Outside the snow was falling.
The wire was hanging far too slack,
The standing waves appalling.

"Page, we must go out again,
Though the frost is cruel.
I see a peasant in the lane
Who's knocking off our fuel."

Therefore Christian hams, take care.
When wires are re-erected,
And you are talking on the air,
Leave not your logs neglected.

As the World Turns – DX

Conducted by Ernest W. Poole, VE3NSZ

A DXer's Dream

**'Twas the night before Christmas, When all through the house,
Not a creature was stirring, Not even my spouse...**

The moon on the breast of the new fallen snow,
Danced on the tri-bander, sparkling below.
The winds played a tune on the G5RV;
Bolton (Ontario) was sleeping, for all I could see...

Down in the shack the rig's LEDs were dim;
My old chair was comfy, and so was the gin.
I slipped on the earphones and adjusted the key;
And tuned through the bands, most carefully.

Forty was open, 'twas such a delight,
The world talking to each other, in the still of the night:
Then in a twinkling came a weak CQ call;
It was thin and fluttery, hardly copyable at all.

With trembling hand I answered real quick—
Hope against hope it was really St. Nick.

"One-M-NIK/air-mobile," he stated.
A long ragchew followed, and I was elated!

He talked of the wonders of things great and small,
Children, love, antennas and DX in the fall.
With "Hi! Hi!" he chuckled in signing with me
"De Dasher, Dancer, Prancer, Vixen, Comet and Cupid—GL 73."

A pileup exploded, 'Twas a thing to behold.
For a contact with Santa is worth more than gold!
I heard David and Steve, Bill and Garry; in the clear,
John, 3IPR, and our club packeteer.

As I recall on that memorable night,
Many a CW contact on his yearly flight.
I heard him exclaim, as he went QRT
"Season's Greetings to all from Ms. Claus and me."

DX ADVISORY COMMITTEE

The ARRL DX Advisory Committee (DXAC) recently voted *not* to pursue the following items:

- Consideration of a DXCC rule revision to permit participation by stations on board docked ships in ARRL awards programs (3 yes, 13 no).
- Changing DXCC country status of former USSR republics (2 yes, 14 no).
- A study of an advanced DXCC award (3 yes, 12 no).
- Changing DXCC country status of 4U1VIC (3 yes, 12 no).

The DX Advisory Committee also voted to recommend the following additions to the DXCC countries list:

Country	Prefix	Vote
Croatia	9A (was YU2)	15-1
Slovenia	S5 (was YU3)	15-1
Bosnia-Hercegovina	YU4	13-3
Macedonia	YU5	12-4

The DXAC intends that the entity of Yugoslavia continue on the list. It is composed of Serbia (YU1), Montenegro (YU6), Vojvodina (YU7), and Kosovo (YU8).

Recommended starting dates for these potentially new DXCC countries: Croatia and Slovenia: 91.06.26; Bosnia-Hercegovina: 91.10.15; and Macedonia: 91.09.08.

All recommendations now go to the ARRL Awards Committee for consideration. Do *not* send QSL cards to the DXCC desk for these countries until they have been officially added to the DXCC Countries List, and a date of acceptance has been declared. —*QRZ DX*

LETTERS

Congratulations to Jack Columbus, VE1XT, and the Breton DX Group. Rule 8, Section 1 of the Basic Rules of the ARRL DXCC Awards remains intact. No doubt, Jack's letter, which is published in part on page 2 of this *QST Canada*, carried a lot of weight with the DXAC group.

COUNTRIES LIST ENIGMA

Clinton DeSoto, W1CBD, writing in 1935 October *QST*, stated a rule unique in its simplicity: "Each discrete geographical or political entity is considered a country". Following long debate, the ARRL Countries List was announced in 1937 January *QST*. The DX Century Club (DXCC) was born in September of that year. That was over 55 years ago, and the popularity of the program has never been greater. The rules established by the founders were consistent with the times. As technology advanced, rules also changed in step, thus assuring continued interest and competition.

World War 2 put the program on the back burner. The world changed. Following the war, and after much debate, the first postwar DXCC rules were published in 1947 March *QST*. Contacts were valid from 1945 November 15, the date when the FCC allowed US amateurs to return to the air.

The DXCC rules of today represent the aggregate of experience gained gained from administering postwar DXCC. Some countries on the DXCC Countries List do not meet the present criteria. This includes countries "grandfathered" from the World War 2 era or those that met the criteria that existed at the time but were not subject to deletion. Section 3 of the DXCC Rules outlines grounds for deletion.

Membership in ARRL's DXCC has been a mark of distinction among radio amateurs the world over. This high regard is a testament to the integrity of the program's administration, and the continued maintenance of high standards.

The DX Advisory Committee (DXAC) is made up of one member from each of the 15 ARRL divisions, and one member from CRRL, for a total of 16. All members are experienced DXers and volunteers. They are a committee with a chairperson and rules of procedure. DX matters are considered and voted upon. Their recommendations are then forwarded to the ARRL Awards Committee.

The ARRL Awards Committee has a complement of eight staff members, all of whom work at ARRL Headquarters in Newington, Connecticut. They are all active DXers and members of DXCC. This group makes the final decisions on all matters related to ARRL contests and awards, including DXCC. This committee *may not* add or delete a country from the list without prior agreement of the DXAC.

Of interest is that, if the DXAC denies a new country request, the Awards Committee takes no action. In nearly all cases, DXAC recommendations are passed as presented.

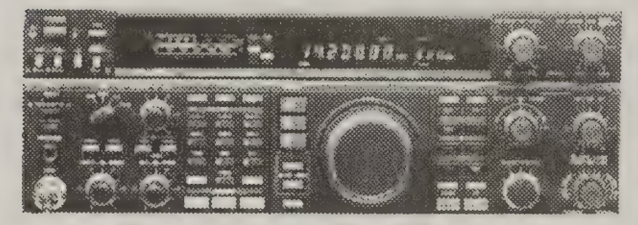
Clinton DeSoto's definition has been expanded to over 1000 words of DXCC country criteria, and over 400 words of deletion criteria. But the original concept

As the World Turns—continued on page 2

KENWOOD TS-850SAT

The TS-850SAT is a competition class HF transceiver designed for SSB, CW, AM, FM and FSK modes of operation on the 160 through 10 meter Amateur bands, including the WARC bands. The 100KHz to 30MHz general coverage receiver has a dynamic range of 108dB.

Advanced digital technology is used to control the various functions, including automatic antenna tuner, one Hz step

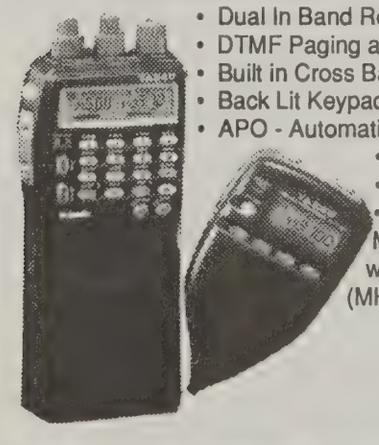


dual VFO's, CW full and semi break-in, superior interference reduction, keyer circuit, dual noise blanker, 100 memory channels, RIT/XIT, and multi-scanning function.

LIMITED TIME OFFER: (ENDS JAN 31, 1993)
Place your order prior to Jan 31, 93 and receive at no extra charge, HS-5 Headphones, and a YK-88C-1 (500Hz CW filter), a $224 value!

YAESU FT-530 *NEW!*

- ATS - Automatic Tone Search (CTCSS)
- AOT - Automatic On Time
- Dual In Band Receive U/U, V/V, V/U
- DTMF Paging and coded Squelch
- Built in Cross Band Repeat
- Back Lit Keypad and Display
- APO - Automatic Power Off



- 82 Memories
- Up to 5 Watts output
- Optional Speaker Mic with LCD Display with Remote Functions (MH-29A2B)

KENWOOD SPECIALS

Until Jan. 31, 1993, you can order the following items and receive some very useful accessories at no extra charge!

TH26A, TH28A, TH78A Handhelds
Free SMC-33 Speaker Mic ($51 value)

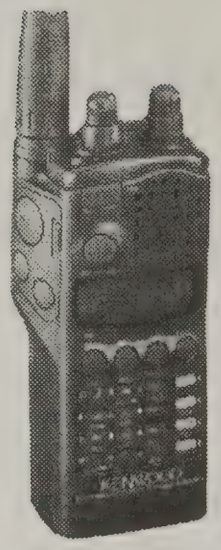
TM-241A, TM-732A, TM-741A mobiles
Free SP-50B External Speaker ($39 value)

TS-140S, TS-690S, TS-450SAT, TS-850SAT
Free HS-5 Deluxe Headphones ($95 value)

TS-850SAT HF Transceiver
Free YK-88C-1 500Hz CW Filter ($129 value)

TS-950SDX HF Transceiver
Free MC-90 Desk Mic ($299 value)

TH-28A
2M HANDHELD



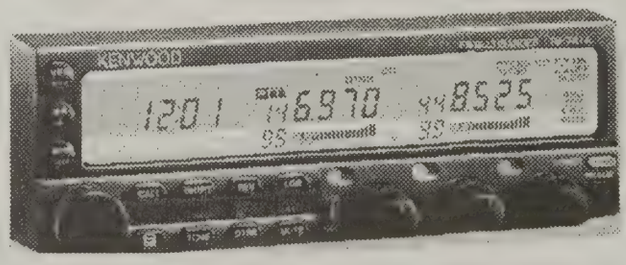
- Dual band Receive (Aircraft, VHF & UHF)
- CTCSS Encode and Decode
- Expandable to 250 Memories (optional ME-1)
- Send and Receive 6 Character Alpha-numeric messages
- Auto-dialler memories
- DTSS Squelch and Paging
- We stock all the accesories
- See the Periphex Add for equivilant replacement batteries
- **Free SMC33 Remote Control Speaker Mic till Jan 31/93**

KENWOOD TM-741A
SAVE $100 $839

Need to be on some other band than 2M or 440Mhz? Add a third band to the TM-741A at your convienence. If you desire to work the 10M British Virgin Island Repeater every day, than add the UT-10S for 10M.

If 6M Dx is your cup of tea, then the UT-50S is for you. Most repeat networks also have access to 220Mhz repeaters with little or no Intermod, and lots of privacy when making phone patches *(Most scanners don't even cover 220Mhz)* UT-220S. Be the first on 1.2GHz. Rumour has it that there are going to be some new 1.2GHz machines soon to be appearing. You will need the UT-1200S.

All of these units offer 100 memories per band, programmable splits in each memory, remote front panel, DTSS, CTCSS and an auto-dialer for making phone patches.



KENWOOD TL-922

10-160M 2000 Watts HF Amplifier. Complete with two Eimac 3-500Z Tubes. Works with most HF radios!

CALL FOR SPECIAL PRICE!

MIRAGE AMPLIFIERS

B-215G 2M Linear Amp. 2-150 Watts, 22 amps	449
B-1016G 2M Linear Amp 10W in 160W out	449
B-108G 2M Linear Amp 10W in 80W out	279
B-3016G 2M Linear Amp 25W in 160W out	399
A-1015G 6M Linear Amp 10W in 100W out	499
D-1010N 430-440MHz Amp 10W in 100W out	519

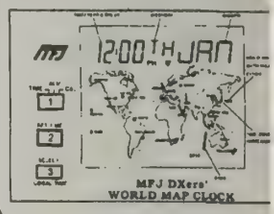
NEW TH-
BANDER!

Kenwood introduces the
dual-band transceiver ir
With alpha-numeric pag
autodialer memories, ar
frequency receive the T
an exciting additon to th
nowned Kenwood line-u

- Dual receive (VHF & U
- Receive 2 UHF or 2 VH
quencies at the same tir
- Alpha-numeric memory
- DTSS *(Dual Tone Sque
System)*
- Transmit & Receive Al
numeric messages
- 50 multi-function memo
nels *(upgradable to 250
with optional ME-1)*
- CTCSS encode & deco
- Double Band Scan
- **Free SMC33 Remote C
till Jan 31/93**

CHRISTMAS

MFJ-107B 24 Hour Clock
MFJ-108 12 and 24 Hour
MFJ-110 24 Hour Clock w
MFJ-112 24 Hour Clock w



VIBROPLEX KEYS

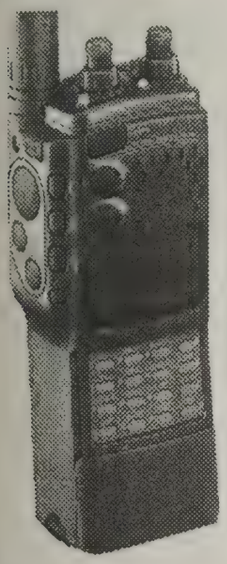
IAMBIC Standard, Topaz
IAMBIC Deluxe, chrome fi
IAMBIC Presentation, Gol
VIBROKEYER Standard,
VIBROKEYER Deluxe, Ch
Original Standard, Topaz
Original Deluxe, Chrome B
Original Presentation, Gol

*If you are not sure about
will discuss all the differe
tation Model comes with*

MERRY CHRISTM

*Lutz, Mike, Nick,
Mario, Howard, Har
& Steve wish you a
your family the best
the upcoming Holid
Season!*

A DUAL

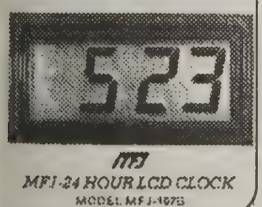


...oth bands

...l Speaker Mic

...FT IDEAS!

.....	$15
...(2 Clocks)	$29
...orld Map	$29
...orld Map	$39



MFJ-24 HOUR LCD CLOCK
MODEL MFJ-107B

.....	149
...lewelled	179
...ed, Jewelled	249
... Base	139
... Finish, Jewelled	179
.....	159
...Jewelled	189
...ed, Jewelled	299

...Key is for you, call and we ...vels with you! The Presen... ...allsign engraved in the key.

ATLANTIC HAM RADIO SWEEPSTAKES

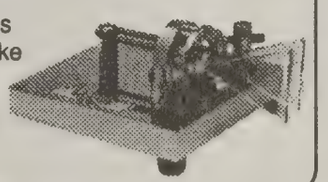
SUPER PRIZE	FT1000 HF XCVR
FIRST PRIZE	2 WEEKS IN SARASOTA CONDOMINIUM
SECOND PRIZE	ICOM DELTA 1HANDY (2M, 440, 1.2GHZ)
THIRD PRIZE	MULTI-MODE DATA CONTROLLER
DEC 92 PRIZE	VECTRONICS VC300 TUNER

Monthly Prizes consisting of Handhelds, Packet Controllers, Antennas and other accessories. Draws will be held the last Saturday of each month. All Ballots received during that month will be eligible for the monthly draw. All entries will be eligible for the Grand Prize Draw to be held on December 15, 1993.

Effective Nov 1, 1992, you will receive 1 (one) entry ballot for every $100 you spend with us. Other entry ballot will be in this magazine and other printed matter.

BENCHER PADDLES

One of the Best Buys...Weighs 1.36Kg-Not even an earthquake will move this key across the table.



BY-1 Black	**$99**
BY-2 Chrome	**$129**

IC-3230H NEW!

Even though the IC-3230H is loaded with many attractive functions for compete dual band capability, it is compact. Measuring just 5.5" x 1.6" x 6.5", like a mono band transceiver, it fits anywhere, in any vehicle. See for yourself how this compact size can make a big difference.

- 30 memory channels, 2 call channels
- Full 45 Watts on 144MHz & 35W on 440MHz
- 3 kinds of frequency search
- DTMF remote control with opt UT-55
- Built in duplexer
- Built in CTCSS tone encoder
- Auto Dialer memories
- 3 selectable power output levels
- Optional Voice Synthesizer
- Optional pager and code squelch functions
- IC2330A 2M/220 Now Available

ATLANTIC HAM RADIO SWEEPSTAKES

NOVEMBER 1992 - DECEMBER 1993

Callsign _____
Name _____
Address _____
City _____
Postal Code _____
Telephone _____

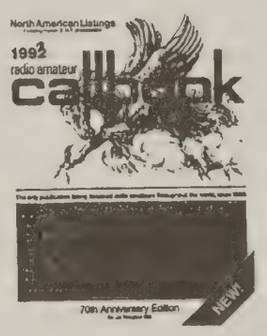
Monthly draws last Saturday of Month (Noon) Nov. 92-Nov 93.
Main Draw Sat. Dec 18/93 (Noon).

QST-12

1993 CALLBOOKS

1993 International and North American Callbooks will be in stock December 7, 1992

Each	**$39**
Both	**$65**



1993 ARRL HANDBOOK

The 1993 ARRL Handbook is now in stock. Many new features, and articles. **$29**

INTERMOD FILTERS $99

All new wideband receivers and Handhelds experience some amount of interference from intermod. Reduce your problems with our Intermod filter from Texpro! *Ask the Hams who worked the Station at the CNE! Without this filter, 2M operation would have been next to impossible.*

- 4MHz bandpass (144-148MHz)
- Can be turned on & off as desired
- Only requires 12VDC
- Installs in feedline to antenna
- No modifications required to your transceiver
- **Made in Canada**

30 DAY PRICE PROTECTION POLICY

If you see the same item (over $250) priced lower at any of our competitors, send us proof and we will immediately credit you with the difference PLUS 10% of that difference as a thank you for pointing it out to us.
No need to phone 6 different stores, we'll guarantee the lowest price. Does not apply to Out of Business sales, Closeouts, Store Demo's, 1 Day Specials, B Stock, and Manufacture's Price Reductions. The item must be in stock.

ATLANTIC HAM RADIO LTD.

MONDAY - FRIDAY 10 A.M. - 6 P.M.
SATURDAYS 10 A.M. - 2 P.M.

AFTER 7PM CALL (416)222-2506
24 HOUR FAX (416)631-0747

368 WILSON AVE.
DOWNSVIEW, ONTARIO M3H 1S9
(416) 636-3636

Shipping is 2% of order (minimum $7.00 Ontario & Quebec, $10.00 all others). Then add 7% GST. Ontario residents also add 8% PST to the subtotal prior to GST. (ie. PST is NOT calculated on top of GST, only on the total including shipping.) Please add 2% for VISA /MC.

CRRL BOOKSHELF

STUDY MATERIALS		PRICE	POSTAGE	STOCK #	✓
Talk to the World		19.00	1.75	1000	☐
Amateur Question Book (Basic)		11.00	1.50	1011	☐
Advanced Question Book		11.00	1.50	1031	☐
Introduction to Morse Code	(OT)	12.00	2.25	1201	☐
Code Tapes-5-10 wpm	(OT)	12.00	2.25	1210	☐
Code Tapes-10-15 wpm	(OT)	12.00	2.25	1220	☐
La radioamateur un univers fascinant		23.00	1.50	2000	☐

BEGINNERS				
Operating an Amateur Radio Station	1.25	1.25	3000	☐
First Steps in Radio	6.50	1.25	3010	☐
Premiers pas en radio, W1FB (RAQI)	7.25	1.25	2020	☐
En Ondes	12.00	1.25	2030	☐
Help for New Hams, W1FB	12.00	1.25	3020	☐
Morse Code-Essential Language 2nd Edition	7.25	1.25	3025	☐

INSIGNIA					
Lapel Pins	(OT)	3.00	1.00	1500	☐
Cloth Diamond 5"	(OT)	3.00	1.00	1520	☐
Cloth Diamond 3"	(OT)	2.00	1.00	1510	☐
ARES Circular Patch 4"	(OT)	4.00	1.00	1530	☐
Set of 3 CRRL Logo Decals	(OT)	1.00	1.00	1590	☐

OPERATING AIDS					
Log Books-pack of 3	(OT)	10.00	3.25	1700	☐
Super Log Books-pack of 3	(OT)	16.00	3.25	1710	☐
Radiogram (message) Pad	(OT)	2.00	2.25	1730	☐
DXCC Countries List (Revised)	(OT)	2.50	2.25	2512	☐
Grid Locator for North America	(OT)	1.50	2.25	2520	☐
Repeater Directory 1992/3	(OT)	7.50	2.25	2541	☐
Net Directory	(OT)	1.50	2.25	2530	☐
World Map (ARRL)	(OT)	14.50	3.75	2551	☐

VHF & UP				
Your VHF Companion	10.00	1.50	6505	☐
UHF / Microwave Experimenter's Manual	24.00	2.00	6510	☐
Microwave Handbook Vol. 1 (RSGB)	40.00	1.50	6520	☐
Microwave Handbook Vol. 2 (RSGB)	40.00	1.50	6521	☐
Microwave Handbook Vol. 3 (RSGB)	40.00	1.50	6522	☐
Satellite Anthology 1st Edition	9.50	1.25	6530	☐
Satellite Anthology 2nd Edition	9.75	1.25	6531	☐
Satellite Experimenter's Handbook 2nd Edition	24.00	1.75	6540	☐
Radio Auroras (RSGB)	21.50	1.50	6565	☐
Weather Satellite Handbook	24.00	1.50	6550	☐

ANTENNA BOOKS	PRICE	POSTAGE	STOCK #	✓
ARRL Antenna Book 16th Edition	24.00	2.50	4001	☐
Antenna Compendium Vol. 1	12.00	1.25	4010	☐
Antenna Compendium Vol. 2	14.50	1.50	4020	☐
RSGB HF Antennas for for all Locations	17.00	1.50	4300	☐
RSGB HF Antenna Collection	22.50	1.75	4310	☐
Antenna Notebook, W1FB	12.00	1.25	4030	☐
Novice Antenna Notebook, W1FB	12.00	1.25	4040	☐
Antenna Impedance Matching	18.00	1.75	4050	☐
Transmission Line Transformers 2nd Edition	24.00	1.50	4060	☐
Practical Wire Antennas	16.75	1.25	4090	☐
Reflections	24.00	1.75	4070	☐
Yagi Antenna Design	18.00	1.50	4080	☐
Physical Design of Yagi Antenna	24.00	1.75	4085	☐

TECHNICAL BOOKS				
1992 ARRL Handbook	29.00	3.00	5001	☐
ARRL Electronics Data Book 2nd Edition	14.50	1.50	5010	☐
Interference Handbook	13.50	1.25	5070	☐
Hints and Kinks 13th Edition	11.00	1.25	5031	☐
RFI: How to Find It and Fix It	18.75	1.50	5021	☐
Solid State Design	14.50	1.50	5040	☐
Design Notebook, W1FB	12.00	1.50	5050	☐
Spread Spectrum Sourcebook	24.00	1.75	5060	☐

OPERATING				
Operating Manual 4th Edition	21.50	2.25	5501	☐
Complete DXer 2nd Edition	14.50	1.25	5510	☐
DXCC Companion	7.25	1.25	5520	☐
Transmitter Hunting	21.50	1.50	5540	☐

PACKET/COMPUTERS				
Gateway to Packet Radio 2nd Edition	14.50	1.50	6000	☐
Proceedings 10th Conference	13.50	1.25	6011	☐

QRP				
QRP Notebook, W1FB 2nd Edition	12.00	1.25	3501	☐
QRP Classics	14.50	1.50	3510	☐
Your QRP Operating Companion	7.50	1.50	3520	☐

MISCELLANEOUS				
50 Years of ARRL	5.25	1.25	7000	☐
200 Metres and Down	9.00	1.25	7010	☐
From Spark to Space	22.50	1.50	7020	☐
Radio Buyers Sourcebook	18.00	1.75	7040	☐
Wireless Communication in US	36.00	1.75	7030	☐

CRRL Publishing, Inc., Box 56, Arva, ON N0M 1C0

How to order: Please return this form or a copy with the items you are ordering checked (✓). In the area to the right, add costs and postage for the items. Then add 7% GST to your total. **Ontario residents only: Add 8% provincial sales tax on total of costs and postage (but not on GST) for all items marked (OT).** Thank you.

Name: _____ Call: _____

Address: _____

_____ Postal Code: _____

Telephone number: _____

Cost of items $_____

Postage $_____

7% GST $_____

8% PST—(OT) items Ontario residents only $_____

Amount of cheque $_____

Conducted By Dana Shtun, VE3DSS
500 Willard Ave, Toronto, ON M6S 3R6
Tel (416) 763-1761

Challenges to our Collective Future

It seems that every time I turn around lately, there are new challenges facing the Amateur Service. To date, we have been on the receiving end of confused and contradictory tower installation requirements, confusing and poorly presented RF field-exposure requirements, and the threat of unlicensed low-power devices (LPDs) that will create RF pollution. While many amateurs may not be directly affected, the VHF-UHF DX fraternity stands to lose big, as the rules for much of the above can easily be misapplied or misinterpreted. Many of us cringe at the thought of subjecting the enjoyment of our hobby to bureaucratic delays, of being at the hands of some faceless administrator, or worse, of being in the hands of some irate neighbour with a politician friend.

As an example, LPDs would not only pollute our bands, they would destroy our ability to detect weak signals. This would impair our ability to work DX or satellites, and otherwise enjoy our bands. On the other hand we would have to suffer the ire of our neighbours whose LPDs were interfered with by our radio signals. Try pointing out to a neighbour that the sticker on their LPD states that he or she "must accept interference". Next thing you know, you're the bad actor on the block, and your neighbour is screaming to your member of parliament.

Towers are another problem. If left unchallenged, who know what might happen if your local municipality is allowed to write by-laws that restrict what you can do. Where do you draw the line? Is a 60-foot free standing tower and a small H-frame reasonable? Is a messy rusty 70-foot guyed tower on the front lawn reasonable? To date, no one will define what is reasonable.

RF fields are yet another issue. We know that no sensible radio amateur is going to install a tower and an antenna array that exposes anyone to high RF fields. Most of us know enough to make sure that the main lobe of our antennas never points into a neighbour's home or yard. Yet, if that same neighbour doesn't like what you are doing, he or she could make your life miserable by alleging that your RF fields are in excess of Health and Welfare guidelines. (These guidelines only consider body heating effects of RF, and strangely enough, do not apply to handhelds.) *You* would then have to be prepared to prove otherwise, and that would likely take a lot of time and effort on your part.

We forgot one thing in our discussion above, and that is the DOC. Can we rely on DOC for support if we face irate, irrational neighbours, or neighbours with hidden agendas? Or will DOC walk away from the mess? Does DOC have the resources—time, money and personnel—to deal with a flood of complaints? Can we look for equal treatment from one DOC region to another? Given today's climate, I am dubious. In today's society, once the damage is done, it's hard to find anyone who will take the responsibility for it, and it's harder still to find anyone who is willing to clean it up.

I personally don't want to suffer the agonies. It would be so much easier if DOC were to adopt the concept of "federal preemption" in matters related to towers, and ensure that LPDs stay out of our bands. This approach would be easy and cheap to administer, and spare all of us needless aggravation and hardship. RF field limits need detailed clarification before we can go along with them. We need to see what the curves look like when developed for a SSB signal, and we need some detailed procedures for assessing side lobe radiation levels. I hope that DOC will be able to support us on this, in light of our varied operating situations and the services we offer to the public. I hope that DOC will not allow our weak-signal subbands to be invaded and destroyed. I'd be interested in hearing from readers across Canada on these issues. What do *you* think?

In the meantime, CRRL continues to work with CARF as it prepares to merge into Radio Amateurs of/du Canada (RAC), with the Radio Advisory Board of Canada (RABC), and with DOC, on all these issues.

Canadian Radio Relay League Band Plan: 1240–1300 MHz

(Revised March 1992)

Status: Amateur Secondary

MHz		*Recommended Utilization*
1240 – 1246		ATV CHANNEL 1
1246 – 1248	ooo	NB FM LINKS, DIGITAL, DUPLEXED TO 1258–1260 MHz
1248 – 1252	...	HIGH RATE DATA (≥4800 Baud)
1252 – 1258		ATV CHANNEL 2
1258 – 1260	ooo	NB FM LINKS, DIGITAL , DUPLEXED TO 1246–1248 MHz
1260 – 1270		SATELLITE UPLINKS (PRIMARY)
1260 – 1270		WIDEBAND EXPERIMENTS (SECONDARY)
1270 – 1276	+++	FM REPEATER INPUTS (25-kHz SPACING)
1276 – 1282		ATV CHANNEL 3
1282 – 1288	+++	REPEATER OUTPUTS
1288 – 1294		WIDEBAND EXPERIMENTAL
1294 – 1295		NBFM SIMPLEX, DIGITAL (1)
1294.5		NATIONAL FM CALLING FREQUENCY
1295 – 1295.8		SSTV, FAX, ACSSB EXPERIMENTAL
1295.8 – 1296		RESERVED FOR EME/CW/SSB EXPANSION
1296 – 1296.05		EME EXCLUSIVE
1296.1		NATIONAL CW/SSB CALLING FREQUENCY
1296.4 – 1296.6	:::	CROSSBAND LINEAR TRANSLATOR INPUT
1296.6 – 1296.8	:::	CROSSBAND LINEAR TRANSLATOR OUTPUT
1296.8 – 1297		EXPERIMENTAL BEACONS
1297 – 1299		DIGITAL (≤ 2400 Baud)
1299 – 1300	...	HIGH RATE DATA (≥4800 Baud) (2)

Footnotes

(1) 25-kHz channelling, 1294.025–1294.175 MHz
(2) 100-kHz channelling, 1299.05–1299.95 MHz crossband duplexed to 430.55–430.95 MHz as required

BANDPLANS

While we are now deregulated and can operate any mode anywhere we like within our bands, provided we do not exceed DOC bandwidth limits, we must observe voluntary bandplans if we are to operate without interference due to mode incompatibilities. Also, observing voluntary bandplans sends a strong message to regulatory agencies like DOC that we do keep our house in order and utilize our spectrum efficiently. See the sidebar above for the current CRRL 23-cm bandplan. As you can see there is lots of room for weak-signal work, packet radio, FM repeaters, satellites and ATV. Try it!

SEPTEMBER VHF QSO PARTY, WESTERN STYLE...

We received lots of contest reports this time. The best comes from Larry, VE6KC, who writes that, with the demise of Novatel Club, Calgary Amateur Radio Association has taken on the twice yearly trip to Plateau

Mountain. Larry writes, "This flat-topped mountain is about 65 miles southwest of Calgary, 8200 feet above sea level. It is about the best VHF radio site that we have ever heard of, but it is also known for its strange and often violent weather. This year was no exception. It was snowing when we got there, and overnight about 18 additional inches fell, with strong winds causing drifts up to four feet in places. We got snowed in, and were rescued by a daring group of amateurs from Calgary—off-road, four-wheel-drive types! We had to abandon our vehicles and all our equipment and walk one and one-half miles through knee-deep snow to reach them. Visibility was so poor they could not find the road! We returned on Sunday to retrieve our vehicles. By then, all the snow had melted." The Calgary group included Russ, VE6KZ; Les, VE6CA; Larry, VE6KC; Bruce, VE6HDO, and John, VE6XT. We don't know about the rest of our readers, Larry, but we think that you and your group exhibit the attributes of true adventurers and true VHF contesters. I guess we in the east shouldn't complain about conditions in the January VHF Sweepstakes, eh?

ON THE BANDS

50 MHz: Mike, VE1MQ (FN65), writes that on September 11, he heard CX4HS ragchewing with XE1GE for about 10 minutes on 50.110 MHz. Mike notes that he is running a beacon on 50.073 MHz. We do not have much to report on six at this time, but we anticipate some DX and Es during December. Keep an eye on 50.110 MHz and 50.125 MHz.

From the *50-MHz DX Bulletin*, Russia has been active on six thanks to OH1ZAA, OH6DD and OH2BC, who made a DXpedition to Vyborg (KP40) on July 5–10. Using the call sign UX1A, they were worked on six metres in Malta and Jersey Island. UA3PW (KO84) is located 175 miles south of Moscow and is reported to be active. In Poland, the first official six-metre activity took place on June 5–15. The call used was 3Z4PAR, a special experimental station authorized by the Polish PTT. The group, which included SP4KM and SP4TKK, operated 15 watts to three- and four-element yagis and worked 888 stations in 28 European countries! Lets hope that Poland continues to be active on six metres!

Looking for a six-metre rig? Icom has replaced the IC-726 with the IC-729. Both radios cover 50–54 MHz.

144 MHz: Mike, VE1MQ, also writes that he did well during the Persieds this year, making a QSO with K5UR (EM35). This is a good example of the long-haul DX that can be worked via meteor scatter without the need for a kilowatt. Mike says that he was running 25 watts at the time to a 16-element F9FT yagi. Look for VE1MQ/B on 144.297 MHz. In Ontario, Peter, VE3VD (FN02), snagged some tropo DX on August 22. This tropo was widely reported by amateurs who succeeded in making DX contacts all the way up to 3456 MHz. Peter worked a lot of DX that evening, starting at 0030 UTC. Among the 14 contacts were WRØG (EN31) Iowa, NØKLT (EN10) and NØIYY (EN11), both in Nebraska, NN9K (EN41), and N9IIF (EN52). Signals were typically 59-plus during the opening. Peter also heard WA9O/M (EN63) on 1296 MHz. On August 24, he worked AB4OR (EM78) in Kentucky. On September 5 at 0115 UTC, Peter again caught a tropo, working WBØCQO (EN31) with signals weak but still Q5.

Kevin, VE3KDH, has revised his plans for VHF activity and now plans to concentrate on two-metre EME. Look for the big new array in the spring. Stan, VE3DSQ, is now QRV on 144-MHz SSB after being away from the low end of the band for 20 years. He notes the big changes that have gone on in technology for weak-signal work since earlier days. He certainly made full use of the new stuff during the September contest. Stan runs a Yaesu FT-736R and a Henry Radio 2002 amplifier with a pair of 8874s sending 1200 watts PEP to a single Cushcraft 215WB at 45 feet, all from Fonthill, Ontario. Stan's QTH is one of the highest spots on the Niagara Escarpment, and is strategically located between the east coast and the central US states. Results during the September contest were something beyond belief! Stan worked eight US call areas, including 12 W5s, and 20 WØs. His best DX was FN42 in the east, EN12 in the west, EM30 in the southwest, and FM18 in the south. Among his contacts were K5YPV (EM54), K3ZO (FM18), KB5NPG (EM44), WB4LHD (EM55), NØKNI (EM38), WØIS (EN42), WA4GVH (EM66), and many, many more. Congratulations to Stan. We hope that he continues to go after DX on two metres.

From the *Northeast VHF Bulletin*, the Side Winders on Two (SWOT) group is sponsoring a VHF/UHF county award for working 100 counties on 50 or 144 MHz, or 50 counties on 220 or 430 MHz. For information, drop a note to Len Parsons, W5AL, 3316 Edenburg Drive, Amarillo, TX, 79106.

220 MHz: Yes we still have the whole 220–225-MHz band in Canada. The band is, and has been since 1979, AMATEUR EXCLUSIVE. Still, I hear reports of packet operators and FMers selling off their gear as if we were going to lose the whole band. A panic like this happened in the US a few years ago, and the only ones who profited were the guys buying gear! This chunk of exclusive spectrum is there for you to use. No intermod, no pollution, no QRM. Many of the weak-signal crew have been on the band for decades. VE3VD has earned Worked All States (WAS) on this band—from Elliot Lake, Ontario, some 300 miles north of Toronto. Propagation is often better than on 144 MHz. I challenge readers to use this band. Your editor has been on 220 MHz since 1971, and is still surprised by the excellent band conditions! We do need others in Canada to get on the 220-MHz bandwagon.

432 MHz: Well I guess the big news is the VE3ONT operation using the Algonquin Radio Telescope, all 150 feet of it! At time of writing, the guys plan to run a kilowatt to the dish. This should make for some very loud echoes off the moon, easily heard with simple antennas at the other end. We will have more on this from Dennis, VE3ASO; Peter, VE3VD; Hans, VE3CRU; Bob, VE3BFM, and Don, VE2DFO, in the future.

Three cheers for Dennis, VE3ASO, for his superb effort to contact the right people and build a case for Amateur Radio operation! Apparently those responsible for the dish were astounded by our capabilities! This is a good time to mention that Dennis has done a great deal to promote VHF activity in Canada, including being among the first to work WA6LET off the moon back in the early 1970s, promoting contesting, and helping others get on VHF. Thanks, Dennis, for all your efforts.

902 MHz: Stu, VE2XX (FN25), reports working into the Rochester, New York-area during the September contest from his QTH west of Montreal running just 13 watts. Stu advises that he has broken his old DX record on 33 cm. Congratulations to Stu, and let's hope we get more activity on 33 cm from around the country.

Speaking of 33-cm activity, Dick, VE3FAC, has almost completed the first of a number of 33-cm amplifier

VHF-UHF—continued on page 2

R & S ELECTRONICS LTD.

157 MAIN ST., DARTMOUTH, NS, CANADA B2X 1S1
Phone: (902) 434-5235, Fax: (902) 434-5590

KENWOOD
Transceivers
TS-950S 3249
TS-950SD 4195

TS-850S 1729
TS-850SAT 1949

TS-450SAT 1669
TS-140S 1069

Power Supplies
PS-33 239
PS-52 299
PS-53 299

ICOM
Transceivers
IC-781 6395
IC-765 2995
IC-751A 1595
IC-735 1149
IC-725 949

Power Supplies
PS-15 229
PS-35 249
PS-55 269

YAESU
Transceivers
FT-1000 3295
FT-1000D 4495

FT-990 2395
FT-767GX 1995

FT-757GX II 1275
FT-747GX 849

Power Supplies
FP-700 289
FP-757HD 349

- Please add 7% GST
- All orders shipped courier FOB Dartmouth, NS
- Credit card orders, add 3%
- NS (Nova Scotia) residents only add 10% PST

An Authorized Dealer
Established in 1976

Send $0.84 stamps or one IRC for Catalog

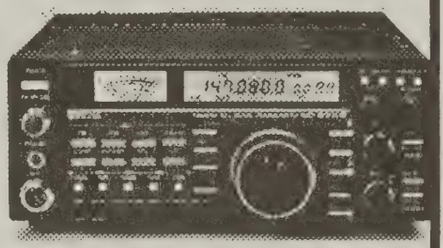
PRODUITS ELECTRONIQUES ELKEL Ltee.®

2435 BL. DES RECOLLETS TROIS-RIVIERES QC. G8Z 4G1
TEL (819) 378-5457 FAX (819) 378-0269
LUNDI FERME Mardi-Mercredi-Vendredi (10h-17h) Vendredi (10h-21h) Samedi (10h-15h)

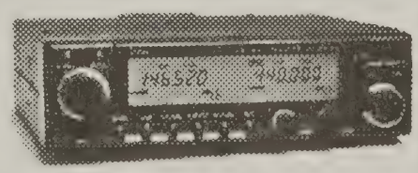
ICOM

ICOM

		LISTE	ELKEL
HF.			
IC-781	.500-30	$7 765.00	$6 799.00
IC-765	.500-30	$3 400.00	$2 999.00
IC-751A	.500-30	$1 937.00	$1 699.00
IC-735	.500-30	$1 363.00	$1 199.00
IC-729	.500-60	$1 681.00	$1 489.00
IC-728	.500-30	$1 300.00	$1 149.00
IC-725	.500-30	$1 039.00	$ 939.00
BASES STATION			
IC-275H	2m	$1 886.00	$1 669.00
IC-575H	26-60	$2 022.00	$1 829.00
IC-970H	2m/70cm	$3 656.00	$3 229.00
MOBILES			
IC-28H	2m	$ 468.00	$ 409.00
IC-228H	2m	$ 506.00	$ 449.00
IC-229H	2m	$ 522.00	$ 469.00
IC-901A	2m/70cm	$1 269.00	$1 139.00
IC-2410H	2m/70cm	$1 108.00	$ 979.00
IC-3230H	2m/70cm	$ 999.00	$ 899.00
PORTATIFS			
IC-2GAT	2m 7w/BP70	$ 475.00	$ 419.00
IC-P2AT	2m	$ 490.00	$ 439.00
IC-2SAT	2m	$ 443.00	$ 399.00
IC-2SRA	2m	$ 681.00	$ 599.00
IC-4SRA	70cm	$ 689.00	$ 609.00
IC-24AT	2m/70cm	$ 543.00	$ 479.00
IC-W2A	2m/70cm	$ 700.00	$ 619.00
IC-X2A	70/23cm	$ 887.00	$ 789.00



IC-2410H



Prices Subject to Change
Without Notice
Authorized Dealer

15
DECEMBER
1992

ICOM

ALINCO...ON A MOMENT'S NOTICE.

New

Model DJ-162TD

A Complete Receiving And Sending Station In Your Hand

This 2M handy combines the best features from the most advanced handhelds available today. Built-in DTMF squelch is standard, as is a wildcard function to help you access any group code that you have programmed without recalling the exact numbers.

There are power saving features such as auto shut-off and timed LCD lighting, timed to turn itself off after 5 seconds of non-use. The display is conveniently located on top of the unit for reading when the transceiver is being carried in your pocket or in a bag. There is even a key lock mode to prevent accidental changing of frequencies, should the buttons be hit while the unit is being handled.

Ask to see ALINCO products at your dealer and become familiar with our quality line and accessories. We've always been here, and now we're ready to go wherever you do.

ALINCO **ALINCO**
ELECTRONICS INC.

ALINCO ELECTRONICS INC.
438 Amapola Avenue, Unit 130
Torrance, CA 90501
Tel. (213) 618-8616 Fax (213) 618-8758

Two Year Limited Warranty.

Specifications and features are subject to change without notice or obligation.

Conducted By David Adams, VE3HBF

Finland's 75 Years of Independence Anniversary Contest

The Finnish Amateur Radio League (SRAL) is sponsoring a contest to mark the 75th year of Finland's Independence. After 700 years as part of Sweden and 110 years under Russia, Finland declared its independence after the Russian revolution in 1917.

Contest period: 0000–2400 UTC, Finnish Independence Day, Sunday, 1992 December 6.

Bands and modes: 80, 40, 20, 15, and 10 metres, CW and SSB. Finnish stations will operate close to the following frequencies: 3525, 7025, 14025, 21025 and 28025 kHz for CW, and 3775, 7075, 14225, 21325, and 28525 kHz for SSB.

Categories: a) single-operator, multiband, b) single-operator, single-band, c) multi-operator, single-transmitter, d) QRP stations multiband (five watts maximum), and e) SWL.

Contest exchange: RS(T) and serial number starting with 001. OH/OG stations give RS(T) and a three-digit OHC (Finnish county) number.

Points: Each valid QSO—one point. A station may be worked once on CW and once on SSB on each band. CW and SSB contacts must be made on appropriate subbands.

Multipliers: Each OHC number (Finnish county) is a multiplier once in the contest. Ten special FIN-suffix stations (OG1FIN, OG2FIN, etc) give five extra multipliers on each band.

Scoring: QSO points x multipliers = final score

Logs: All times must be recorded in UTC. Multipliers (OHC numbers and FIN-suffixes) must be indicated once per band. Entries with over 300 QSOs must include a dupe sheet.

Awards: Certificates and special prizes will be awarded to top scorers in each category. Each DXCC country and each US and Japanese call-area winner will be awarded a special certificate.

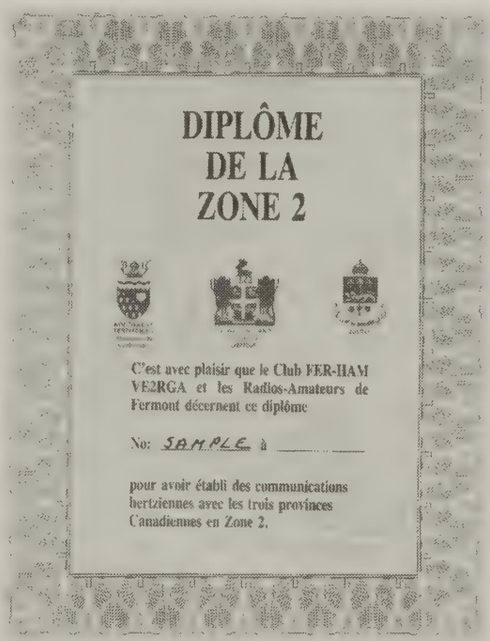
Deadline for submitting logs: All entries must be postmarked no later than 1992 December 31 and sent to Finnish Amateur Radio League (SRAL), Attention Jukka Kovanen, OH3GZ, Box 44, SF-OO441, Helsinki, Finland.

ZONE 2 AWARD

The Diplome de la Zone 2 is issued by Club FER-HAM VE2RBA of Fermont Quebec. It is available to licensed radio amateurs and SWLs. Contacts made since 1980 January 1 are valid.

Confirmed contacts are required with VE2, VO2 and VE8. Stations in Quebec north of 50th parallel are in Zone 2. VE8 stations east of 102° W and north of 50° N are in Zone 2. All VO2 stations are in Zone 2.

Do not send QSL cards. Instead, send a list showing details of contacts, certified by two licensed amateurs. Fee for this award is $3 or eight IRCs. Send to Gilles Soucy, VE2GSO, Box 46, Fermont, PQ G0G 1J0.



DIPLÔME
DE LA
ZONE 2

C'est avec plaisir que le Club FER-HAM VE2RGA et les Radios-Amateurs de Fermont décernent ce diplôme

No: SAMPLE à _____

pour avoir établi des communications hertziennes avec les trois provinces Canadiennes en Zone 2.

HERITAGE AWARD

This award is sponsored by Heritage ARC of Cobourg–Port Hope, Ontario. Ontario (VE3) stations make two-way contact (or SWL heard), on any band using any mode, with 50 different Ontario (VE3) stations, ten of which must be located along Ontario's Heritage Highway—old Highway 2—from Toronto to the Quebec border.

If Highway 2 is in a city or town, the postal address will serve to confirm that a station there is indeed a Heritage Highway contact (e.g. Metro Toronto or R. R. 6, Cobourg, etc).

As the Heritage ARC meets at the Port Hope Yacht Club adjacent to Highway 2, all club members qualify as Heritage Highway contacts.

Other Canadian provinces and US states require 30 VE3 contacts with six along the Heritage Highway.

Outside North America the requirement is 15 VE3 contacts with three along the Heritage Highway.

To receive the award, send $4 and copy of logged contacts including name and location, with alphabetical check list flagging Heritage Highway contacts, to Bill Turland, VE3MDE, President Heritage ARC, R. R. 5, Cobourg, ON K9A 4J8.

DXPEDITION TO INAUGURATE NEW THAI PREFIX

To inaugurate Thailand's new prefix, E28DX will operate from Koh Samui Island, 600 kilometres south of Bangkok, 9.5°N, 100°E, from 0800 UTC 1992 December 10 until 2400 UTC 1992 December 12, on the following frequencies: 14.030, 21.030 and 28.030 MHz on CW, and 14.195, 21.200 and 28.480 MHz on SSB. Also look for E28DX on RTTY.

Liaison for this operation is Ray, HSØ/G3NOM. Donations in support of this DXpedition would be appreciated. QSL to HS1HSJ at Box 89, 10220 Bangkok, Thailand, or via the bureau. Please include IRCs with your self-addressed envelope. ■

HELP WANTED

Malcolm Hamon, VE3KXH, in conjunction with IARU, coordinates the Canadian Monitoring Service, and he needs your help. He is looking for Canadian amateurs to form part of a monitoring team to help combat the problem of intruders on our amateur bands. Please contact Malcolm at 5 East Bank Road, Newcastle, ON L1B 1B7, Tel/Fax (416) 623-0472. ■

Silent Keys—

Conducted By Ray Staines, VE3ZJ

It is with deep regret that we record the passing of these amateurs:

VE1AE, Willard Kelso, Sussex, NB
VE3AKW, Miles "Slim" Crosby, Hamilton Beach, ON
VE3AMM, Steve Znideric, Port Hope, ON
VE3DOF, Clarence Fudge, North Bay, ON
VE3HGK, Dan Arnoldi, Barrie, ON
VE3RMQ, Wray Simms, Sarnia, ON
VE6ARH, Jan Zaworski, Edmonton, AB
VE7ABD, Irvin Bushwell, Lumby, BC
VO1FN, Ben Collins, St. John's, NF
VO1SV, Stan Matchim, Goulds, NF

Note: Silent Key reports sent to *QST Canada* must include name, address and callsign of the reporter. To avoid unfortunate errors, reports are confirmed only through acknowledgement from the family of the deceased. Thus, those who report a Silent Key may not receive an acknowledgement from *QST Canada*. ■

Section News/Nouvelles des Sections

Conducted By Ken Oelke, VE6AFO

The CRRL Field Organization Forum

REPORTS FOR SEPTEMBER 1992

Reports invited: CRRL Section Managers (SMs) and their Section-level assistants coordinate traffic handling, emergency communications and bulletin service across Canada. Your SM (name and address appears on page 2 of this *QST Canada*) welcomes reports of individual and club activities for publication in this column. Activities do not have to be related to the CRRL Field Organization or to CRRL.

Alberta: SM: Don Wilcox, VE6CG; STM: VE6AKY; SEC/TC: VE6AFO; OO: VE6TY. No report available.

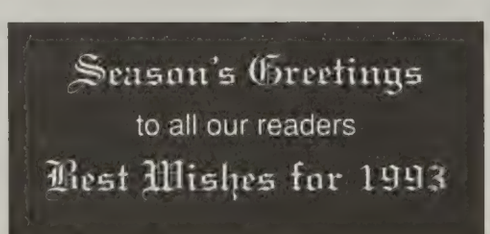
British Columbia: SM/SEC: Ernie Savage, VE7FB. British Columbia Public Service Net (BCPS, 3729 kHz, 0130 UTC daily): Net Manager Jim, VE7JN, reports check-ins: high—206, low—86, total—4791. British Columbia Emergency Net (BCEN, 3652 kHz, 1900 UTC): Net Manager Ray VE7BCL reports QNI 1312, QTC 534. Newcomers are doing well and the net is growing every month. BCEN had an increase of five on the net, and QTCs were up. The BCEN *Newsletter* has a new editor: Ferdie, VE7EJU, General Delivery, Heffly Creek, BC V0E 1Z0. He will be going to press soon. If you have news or want the *Newsletter*, the two above nets will look after your enquiries. We in this office say "thanks" for all the newsletters we receive. Please keep them coming. 73.

Manitoba: SM: Bill Crooks, VE4JR; ASM: VE4IX; STM: VE4STU; SEC: VE4PN, NMs VE4FP, VE4LB, VE4TE and VE4TY. Notes from VE4: The Brandon Amateur Radio Club (BARC) held its Annual Flea Market and Auction on October 3 in their fair town. About 40 attended from all over VE4-land, with people from Winnipeg, Portage la Prairie and many other communities. Missing were several rural people preoccupied with their crops due to the late harvest. It was good to see Walt, VE4OO, and Mike, VE4OM, with their extra efforts in attending this year, and I thank Charlie, VE4LB, again for guiding us all in to VE4QB. This report was sent in by Bill VE4UX—Thanks, Bill. Now that September has come, fall training classes have started. Winnipeg ARC has 27 students under the guidance of Rick, VE4OV. Ages run from teens to seniors, and there are three YLs. Winnipeg Seniors ARC also has classes under way, with 15 students. Congratulations to Adam, VE4SN, in attaining 316 confirmed DX countries, with ten more cards to come. Gil, VE4AG, has accepted appointment as OBS, and has custodianship of the VE4QST call. No doubt you will be hearing more from Gil. I wish to thank Malcolm, VE4MG, for a job well done. He had to relinquish the OBS for personal reasons. Congratulations to Dave, VE4PN, our SEC, who was sent to Hawaii by the Canadian Red Cross to help with communications after recent hurricanes disrupted power and telephone lines.

Maritimes-Newfoundland: Acting SM: Carl Anderson, VE1UU; STM: Mel Lever, VE1VX; BM: Brent Taylor, VE1JH. No report available. The Maritimes-Newfoundland Section does need a Section Manager. Please contact the Acting Section Manager or CRRL for details.

Ontario: SM: Larry Thivierge, VE3GT @ VE3OSQ; A/SM and BM: VE3AV @ VE3JF; A/SEC: VE3GT @ VE3OSQ; STM: VE3CYR @ VE3KRG; TC: VE3EGO. Please note my change of packet bbs from VE3WQ to VE3OSQ. Congratulations to the incoming executive of RAC, Radio Amateurs of/du Canada. Let's all rally behind them to help make the new organization a success in representing Amateur Radio in Canada. VE3CNE held another successful Amateur Radio display during the run of the Canadian National Exhibition in Toronto, with a number of local clubs pitching in to help out. HF, VHF and packet radio displays were going pretty well full blast daily during the event. Two BPLs were earned for their traffic handling activities. VE3DDI is now VE3SS. The call sign at packet node LKBAYS:VE3MUS-9 has been changed to LKBAYS:VE3MUS. And, to reflect the change of management of the VE3RTR packet node site of the Toronto Packet Group, the callsign of that node has been changed to VE3EPG. Regretfully, I report that VE3AQY and VE3GCE have become Silent Keys. ECs reporting this month were VE3FS and VE3LPM. The volunteers of the Ontario Trilliums ARC, the Ontario Incoming QSL Bureau, do a terrific job of sorting and redirecting thousands of QSL cards each year. You can do your part by ensuring that you use maximum sized 5″ x 7″ envelopes and have at least $2 in postage with them. The Toronto FM Society membership total has reached 652. VE3IIB is using a new FT-767GX. VE3MS continues to rack up the DX contacts. Congratulations to VE3CWE for his first place finish (Ontario, CW) in the ARRL 10-Metre Contest and first place in Canada (CW and SSB) in the WAE contest. And congratulations to VE3YBC on being named this year's winner of the Joe Norton Trust Award administered by the Ottawa ARC. The Heritage ARC of Cobourg-Port Hope is sponsoring the Heritage Award. Ontario stations must make two-way contacts with 50 different Ontario Amateur Radio stations, ten of which must be along that portion of Ontario's Heritage Highway (old Highway 2) from Toronto to the Quebec border. On behalf of the this Section's Field Organization, may I extend to each and every one of you the compliments of the holiday season, with best wishes for 1993.

Quebec: SM: Joe Unsworth, VE2ALE; STM: Jean, VE2ED; OBS: Garnett, VE2GOP and Joe, VE2ALE. As per special bulletin by CRRL, all Quebec Section field organization positions are to remain as they are at present. From NCS VE2ED: Les activités ont reprise sur le réseau QSN le mois de septembre. Les stations QNI sont VE2: YAT, ADD, QY, CUD, OPB, NM, SIM, GIW, EFE, LPS, IA et BMX; VE3: GT et ET; et W3OKN. Le réseau QSN opère en CW sur 3670 kHz du lundi au vendredi à 1930 heure locale. Tous sont les bienvenues. Over 1000 amateurs attended the Drummondville Hamfest on September 26—a very successful day for the organizers. CRRL officials seen there included VE2s IJ, DO, BP, and ALE. Recent amateurs visitors to Montreal area include Eugen, RA9JW; VE6KRL and VE7CLC. Bill, VE2GK, is working on a list of amateurs who have been and are now active in the PL Net, at 0800 and 1600 local time, on 3787 kHz Monday–Friday. Tower power: VE2AUU is reactivated on the bands with new tower, antennas and equipment. From Ken, VE2EXC: The St. Lazare ARC, using VE2LZR, supplied the communications for the St. Lazare Horse Trials 1992. Participating were VE2s EXC, AFA, BOQ, DC, FRZ, KN, PTZ, SJA, TW, WHO, and YAK. Eighty horses and riders participated. Due to the very wet and slippery day there were only four casualties, all of which were minor with no injuries.



Saskatchewan: SM: Joan Lloyd, VE5JML @ VE5AGA. Congratulations to new amateur Cheryl, VE5CAP, and to Jim, VE5JS, formerly VE4WO of Creighton. We welcome to the CRRL team Todd, VE5MX, as AEC for the Weyburn Area. Executive and directors have been named for the Saskatchewan Amateur Radio League (SARL): President—Eric, VE5HG; Vice President—Bruce, VE5ND; Secretary—Ned, VE5NED; Treasurer—Joan, VE5JML; Directors: Saskatoon—Wayne, VE5PE; Saskatoon Area—Russel,l VE5KA; Yorkton Area—Murray, VE5ACI; Regina—Jerome VE5KZ; Prince Albert—Keith, VE5XZ; Battlefords and Area—Gordon, VE5YB; Moose Jaw—Al, VE5AQ; Swift Current—Harry, VE5HB; Melfort-Nipawin—Vic, VE5AE. A director is still needed for Saskatchewan Southeast. On September 29, Regina-area amateurs participated in a mock disaster at Regina Airport. A passenger aircraft "crashed" short of the runway, into cars on a busy expressway. The amateurs involved provided communication from the site to the hospitals, relaying information on the number of incoming casualties, and acted as communications liaison for the police, fire department and emergency measures organization. Thanks to all who participated in the exercise. Saskatchewan amateurs can look for a writeup in the next issue of *QSO* magazine. 73 to all. ■

September Hurricanes

Joe Vanschagen, VE3NDX, Emergency Coordinator of the Niagara Peninsula ARC, covered September's emergencies in the October *NPARC Feedline:*

"Our American cousins have certainly had a busy September. Amateur Radio once again came to the rescue as hurricanes caused major communications failures in Florida, Louisiana and Hawaii. Amateurs provided local and state-wide emergency communications to rescue teams, and helped direct crews delivering emergency shelters, food and water to the affected areas. Storm nets were active on 14.268 and 14.285 MHz as well as 40 and 80 metres. Congratulations to all those who helped pass hurricane traffic and those who just listened and gave them a clear frequency. The effort was not without cost. A Florida amateur was killed when struck by lightning while helping unload relief supplies from a helicopter. Witnesses say he was carrying his handheld when the strike occurred. Expect to read a lot of interesting first-hand reports in *CQ, QST* and *73* in the coming months."

YORK REGION ARES

York Region ARES, which has been inactive for several years, has taken a new lease on life under EC Rick Simpson, VE3LSZ. One of the accomplishments has been the creation of an 86–page emergency response plan, prepared by Rick and Brian Greiner, VE3SPZ, of York Region ARC.

During the past several years I have received and studied over a dozen emergency communications plans. When I opened the York Region Plan, I realized it had a number of unique features. The first part of this well organized plan is an overview of ARES and the services it can provide. It is intended for distribution to police, municipal authorities and other potential users of ARES services. The rest of the plan details the equipment and training required for each type of service the group can provide. It also covers net operations, handling of formal and informal traffic, etc. The format is very clear and contributes much to the effectiveness of the plan. Some of the features I particularly liked were:

- a checklist of the information that should be supplied by any agency that activates the emergency net,
- a short descriptions of the six types of communications that York Region ARES is prepared to provide. These are: voice traffic, data traffic, dispatch, surveillance, paging, and even amateur television.
- details of the duties, equipment and skills of a National Traffic Service (NTS) operator in an emergency organization,
- an outline of the eight different types of skills and background that a qualified ARES operator is expected to have. These include formal traffic handling, net control and operating experience in simulated or real emergencies, and Red Cross training. For each, the goals and requirements are listed, and
- information on how to calculate the number of battery packs required for any

Field Organization Reports September 1992

CRRL Section Emergency Coordinator Reports

Reports were received from the following:

Reporting	ARES Members
VE3GT	543
VE7FB	160

CRRL Section Traffic Manager Reports

Call	Orig	Rcvd	Sent	Dlvd	Total
VE1BTV	0	23	24	0	47
VE1YS	0	21	21	0	42
VE1ALU	0	6	6	0	12
VE1VAR	1	5	1	1	8
VE2ALE	54	77	338	0	469
VE2GOP	0	44	97	0	141
VE2ED	0	13	4	8	25
VE3CNE	144	7	131	0	282
VE3ORN	15	60	140	16	231
VE3HZQ	1	56	87	3	147
VE3BDM	0	50	60	2	112
VE3AJN	0	60	48	2	110
VE3CYR	0	79	16	0	95
VE3DVE	0	34	49	0	83
VE3GT	0	33	47	0	80
VE3PXR	8	19	25	3	55
VE3GNW	0	17	21	0	38
VE3WV	0	31	3	0	34
VE3AAU	0	8	13	1	22
VE3FS	0	2	11	9	22
VE3MNI	1	6	9	4	20
VE3LPM	0	3	7	3	13
VE3KCZ	1	5	2	4	12
VE3NVJ	0	2	7	0	9
VE3BAJ	0	1	3	1	5
VE3GKB	0	2	2	1	5
VE3SB	0	1	0	1	2
VE4JR	0	47	7	10	64
VE5KZ	5	29	27	2	63
VE6XG	9	37	17	10	73
VE6CE	17	26	24	3	70
VE6CPP	1	10	10	0	21
VE6AKY	3	2	2	2	9
VE7BNI	27	211	319	45	602
VE7BCL	2	115	43	30	190
VE7ANG	1	74	67	5	147
VE7XA	0	34	32	13	79
VE7OM	2	24	31	2	59
VE7CCJ	1	29	27	1	58
VE7FME	0	30	10	0	40
VE7EJU	0	19	11	0	30
VE7FRZ	2	21	4	1	28
VE7BZI	8	10	9	0	27
VE7WI	0	18	9	0	27
VE7VO	0	19	6	1	26
VE7BUU	0	23	1	1	25
VE7DKS	0	20	4	0	24
VE7EGM	1	16	4	1	22
VE7GKA	0	16	5	0	21
VE7BOP	0	14	3	1	18
VE7BCF	2	11	4	0	17
VE7DJ	0	14	1	0	15
VE7ALV	1	9	1	0	11
VE7CZW	0	6	0	0	6
VE7FB	0	2	3	1	6

National Traffic System

Net (Mgr)	Sess	QNI	QTC
APN (VE1YS)	27	107	n/a
QSN (VE2ED)	16	56	8
KTN (VE3AJN)	13	133	10
NPN(VE3NDI)	27	282	2
OLN (VE3POJ)	28	879	61
OPN (VE3AJN)	30	576	246
OQN-D (VE3ORN)	20	60	16
OQN-E (VE3CYR)	28	124	71
MEPN (VE4LB)	30	976	19
MMWX (VE4TE)	30	394	18
SEPN (VE5CJ)	28	1374	8
APSN (VE6AKY)	30	1064	11
ATN (VE6CPP)	30	134	53
BCEN (VE7BCL)	30	1231	534

Brass Pounders' League

This listing is available to amateurs who report to their SM a traffic total of 500 or a sum of originations and delivery points of 100 or more for any calendar month. All messages must be handled on amateur frequencies, using standard ARRL-CRRL form, within 48 hours of receipt.

Public Service Honour Roll

(1991 Revision) This listing is for amateurs whose public service performance during the month indicated qualifies for 70 or more points in the following eight categories (as reported to their SM).Maximum points per category: (1) Checking into a public service net, any mode, 1 point each, maximum 60; (2) Acting as Net Control Station (NCS) for a public service net, any mode, 3 points each time, maximum 24; (3) Performing assigned liaison between public service nets, 3 points, maximum 24; (4) delivering a formal message to a third party, 1 point each, no maximum; (5) Originating a formal message from a third party, 1 point each, no maximum; (6) Serving as a CRRL SM or field appointee, 10 points for each office, maximum 30; (7) Participating in a communications network for a public service event, 10 points each event, and (8) Providing and maintaining an automated digital system that handles messages in standard ARRL-CRRL format, 30 points. Those qualifying for Public Service Honour Roll 12 consecutive months, or 18 months out of 24, will earn a special certificate.

PSHR: VE2ED (104), VE3ORN (209), VE3AJN (130), VE3BDM (130), VE3GT (128), VE3CYR (122), VE3HZQ (112), VE3FS (102), VE3DVE (73), VE4LB (82)

Service and Specialized Nets

Independent Net Managers: Your monthly reports are welcomed. Please send your reports to CRRL, Box 56, Arva, ON N5Y 4J9.

Net (Manager)	Sess	QNI	QTC
ONTARS	31	11868	0
GBN (VE3WV)	29	83	8
GBSSN (VE3WV)	29	95	36
Manitoba Repeater	8	700	0
Aurora 1 (VE5ND)	26	1053	4
Aurora 2 (VE4FP)	26	1061	0
Prairie WX (VE5EX)	30	607	0
Sask ARES (VE5FY)	4	239	2
Sask 2-m (VE5HG)	30	986	0
MJARC 2-m (VE5JJP)	30	485	0
ARG 2-m (VE5EE)	27	943	0
Alberta ARES (VE6AKY)	8	269	4

handheld transceiver to be used in emergency communications. York Region's standard requires sufficient packs for one hour of continuous "key down operation".

This listing just scratches the surface—there's much more in this 84-page opus. Brian Greiner, VE3SPZ, is offering the plan to any ARES group. It is available on floppy disk for an IBM or compatible computer in WordPerfect 5.1 format. Just send him a disk and he will be happy to furnish the complete file. I highly recommend a review of this plan to any group that is revising its own plan, and looking for ideas for improvement.

This plan has had one good testing, in an exercise with the Red Cross held last May. As Brian reported:

"From the beginning, we have been in close contact with the Red Cross Emergency Services Committee, which acts as a coordinating group for all agencies offering emergency services in York Region. Since both ARES and the Red Cross have a large number of new people, it was decided that some sort of training exercise would be a good idea.

"Once this decision was made, a committee was struck to plan the event. A date for the mock disaster was set and the committee was faced with the daunting task of deciding what to do. It sounded simple at first, but then reality set in. What agencies would take part? How many people would take part? What would be tested? How would we evaluate responses, etc?

"When the smoke cleared, it was decided that the Red Cross and ARES would take part in a four-hour exercise. Red Cross would test its callup procedures and its R and I (registration and inquiry) handling. ARES would test its callup and message handling procedures. To add realism, the three of the sites used, the Red Cross Headquarters and two community centres, were official evacuation sites. To add spice, the committee set up a schedule of simulated problems such as power failures, loss of repeaters, loss of antennas and equipment failures. As an unplanned 'bonus', two of the sites were 'communications-hostile'. One was in a basement and the other was in a steel-enclosed building.

"The day of the exercise dawned warm and sunny, and the 'disaster' was set in motion. ARES teams were dispatched to the various sites, which proved to be even more communications-hostile than anyone had imagined. An ARES command and control station was established in the Red Cross Headquarters, and was passing traffic within ten minutes of arrival. Unfortunately, traffic nets were already operating before the command and control nets were well established. This resulted in some control problems and message pileups. Most of the ARES personnel came with handhelds, which proved inadequate for reliable simplex operation. On the positive side, whenever there was any equipment failure, simulated or real, spare rigs were readily available!

"Solving the problems posed by site location proved to be a major headache, since they made communications difficult and ate up manpower. Both ARES and Red Cross experienced manpower shortages and operator fatigue.

"At the end, all participants were encouraged to fill out an exercise critique form. The overall feeling was that the test had been very worth while. The two groups went away with a better appreciation of their roles in an emergency situation. Enough went right to encourage people, and enough went wrong to make them think. And people were eager for another test in the fall!"

My sincere congratulations to VE3LSZ, VE3SPZ, and the other members of York Region ARES and York Region ARC. They have taken a well-organized approach to reactivating an effective ARES group which was badly needed to serve their major metropolitan area.

KINGSTON ARES OPERATIONS MANUAL

Here in Kingston we decided recently to create a separate manual to document our emergency operating procedures and net organization. Some of this material was previously contained in our Emergency Communications Plan, but it seemed to make more sense to assemble everything related to operations in a separate document. Our Operations Group, under AEC Don Southcott, VE3AGY, undertook this assignment, and decided on a two-part format: Part 1 to cover voice-operated networks and Part 2 to cover packet radio operation.

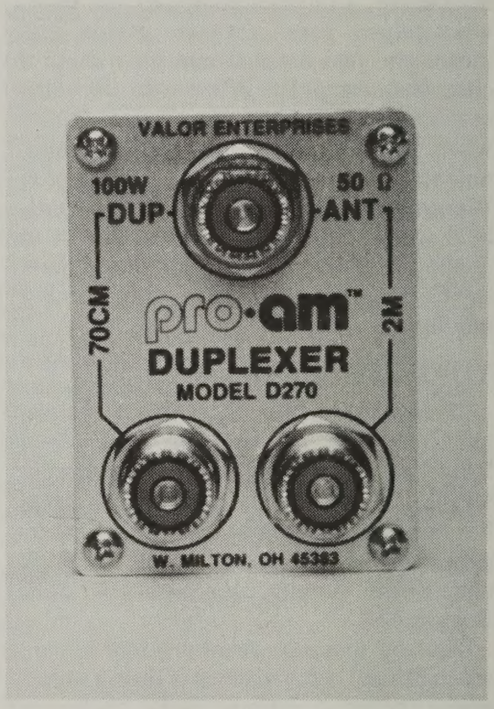
Art Blick, VE3AHU, who has had many years of experience in emergency communications, took on the creation of Part 1, comprising 28 pages. It is now complete and in the hands of all our ARES members. Part 2 is being prepared and should be ready this winter.

Part 1 pulls together everything an agency station operator or a net controller should know to provide effective voice communications. It covers how to establish an emergency net, the functions of the net control station, the operation of the OUT stations, arrangements for relay station operations, and the handling of interference by offers of help from well-meaning but untrained non-ARES amateurs. It also covers the handling by voice of radiograms, including the fine points related to numbers and punctuation.

Please drop me a line if your group would like to receive a copy of Part 1 of the *Kingston ARES Operations Manual.* A donation of $6 to our ARES group would be appreciated, to cover the cost of photocopying and mailing. That's it for this month. Seasons's Greetings to all. Keep those cards and letters coming. —*Bob Boyd, VE3SV* ■

New Products

PRO•AM D270 DUPLEXER



Pro•Am has announced a new D270 duplexer for 2 metres and 70 cm. This can connect a VHF/UHF dual-band antenna with a single feedline to separate 2-metre and 70-cm transceivers, or to a dual-band transceiver without a built in duplexer. It can also be used in reverse to connect separate antennas to a 2-metre/70-cm dual-band transceiver with only one RF output connector

The D270 is useful for crossband repeaters. It can be combined with a single 2-metre/70-cm antenna for dual-band mobile use. It covers 144–148 and 430–450 MHz. It has a wide bandwidth with low SWR. Insertion loss is claimed to be 0.3 dB on 2 metres and 0.4 dB on 70 cm. RF power rating is 100 watts.

For price or ordering information, contact PRO•AM, Valor Enterprises, 185 West Hamilton Street, West Milton, OH 45383. ■

PRODUITS ELECTRONIQUES ELKEL Ltee.®

2435 BL. DES RECOLLETS TROIS-RIVIERES QC. G8Z 4G1
TEL (819) 378-5457 FAX (819) 378-0269

LUNDI FERME Mardi-Mercredi-Jeudi (10h-17h) Vendredi (10h-21h) Samedi (10h-15h)

KENWOOD

KENWOOD

HF.			LISTE	ELKEL
TS-950SDX	.500-30MHz	*w/MC-90	$ 5 689.00	$ 4 949.00
TS-850SAT	.500-30MHz	*w/YK-88C/HS-5	$ 2 399.00	$ 2 039.00
TS-450SAT	.500-30MHz	*w/HS-5	$ 1 989.00	$ 1 589.00
TS-440SAT	.500-30MHz	*w/synt. voix	$ 1 949.00	$ 1 549.00
TS-690S	.500-60MHz	*w/HS-5	$ 1 989.00	$ 1 699.00
TS-140S	.500-30MHz	*w/HS-5	$ 1 339.00	$ 1 049.00
TL-922	(2) 3-500Z ampl.		$ 2 595.00	$ 2 199.00
DSP-100	Digital DSP		$ 830.00	$ 699.00

TS-850SAT

BASES STATION

TS-790	2m/70cm		$ 2 620.00	$ 2 289.00

MOBILES

TM-241A	2m	*w/SP-50B	$ 600.00	$ 419.00
TM-732A	2m/70cm	*w/SP-50B	$ 998.00	$ 759.00
TM-741A	2m/70cm	*w/SP-50B	$ 1 256.00	$ 839.00

PORTATIFS

TH-26AT	2m w/ctcss	*w/SMC-33	$ 388.00	$ 349.00
TH-28A	2m	*w/SMC-33	$ 533.00	$ 429.00
TH-78A	2m/70cm	*w/SMC-33	$ 776.00	$ 659.00

Prices Subject to Change Without Notice / Authorized Dealer

15 DECEMBER 1992

*Promotion Expires 31 January

KENWOOD

Choose Your Mobile In 3 Easy Steps:

Step 1 Choose Your Bands!

Single Band: 2 Meters

Today's most popular band, the best place for new hams to meet old hands, learn good operating procedures. Very friendly, thousands of open repeaters & autopatches everywhere. Great for on/off-the-road help. Crowded, though, especially in cities. Single-band mobile is easy to learn & use. No-Code friendly!

Multiple Band: 2 Meter/440MHz

The two most popular FM bands. A "natural" mix of high activity & special group channels, this is becoming the amateur's favorite mobile rig. Instant control of either band, and you can set up your station as a crossband full-duplex repeater. Gateway into advanced operating systems unavailable on 2M.

440 MHz

Next most popular band, less crowded with more high-tech, "smart" repeaters offering autopatch, remote base, linking, digital-voice recording. Some are limited-access (PL). Allows crossband repeating between singleband handhelds & dualband mobiles. 440 gives access to advanced technical info. This is where the pros hang out! No-Code friendly!

2Meter/220MHz

For the unconventional, this combines the most popular & the least crowded bands. Gives access to the people & services on 2M, plus the privacy & open space of 220, plus the advantages of telephone-like duplexing. Valuable where privacy is a concern.

220MHz

Fairly quiet, less crowded than 440, with almost half as many repeaters and the same high-tech functions. Plenty of open channels for semi-private conversation. Great place to meet newcomers, youngsters. Ideal for ham family, since all classes have voice privileges on 220. No-Code friendly!

2M/440MHz/1.2GHz

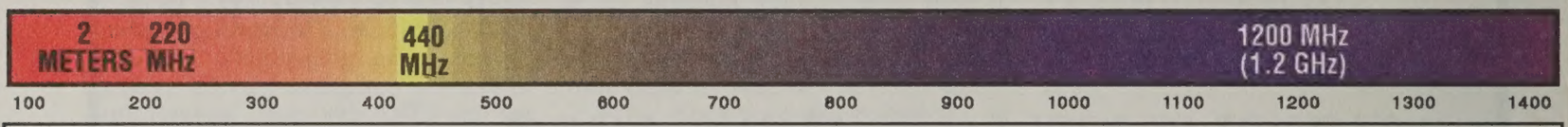
If you live and breathe radio, these are the bands for you! They give you the activity, the expandability and the novelty. Particularly useful for advanced hams who work in the city and live in the suburbs.

1.2 GHz

Radio's new frontier for ham pioneers. Shorter range than 2M or 220/440 in the open, but penetrates buildings, even elevators & underground garages. Excellent for cities. Crystal clear reception. Signals can be "bounced" for distance. Number of repeaters increasing faster than any other band.

MultiBand

Widest selection of all: start with 2M/440. Add 6M for No-Code Skywave privileges. Add 10M for Novice and Tech-Plus privileges. Add 1.2GHz for the big city. If you're a shortwave buff, add scanning and SWL. Additional capacity sold as add-on modules.



Step 2 Choose Your Radio!

IC-28H 2 Meters

Ideal starter rig. 45-W single band, 21 memories, LCD display. Receives NOAA/WX

IC-228H 2 Meters

Same as IC-28, w/ color display, more skip & scan features & priority watch.

IC-229H 2 Meters

Even more features – automatic dialing, 50W power, ultracompact case.

IC-449H 440MHz

35W UHF transceiver, 20 memories, scanning, optional autodial.

IC-38A 220MHz

Same as IC-228H, with 220's privacy, 25W & 21 memory channels.

IC-1201 1.2 GHz

A natural for the city. Penetrates structures. 10W output, 20 memories & priority watch.

IC-3230A/H DualBand

One touch control, color-coded controls. 25/45W output, simultaneous reception, crossband repeat, 15 memories/band.

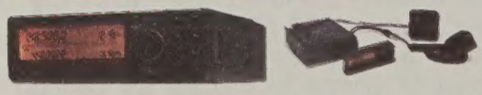
IC-2410A/H DualBand

Same functions as IC-3230, plus ParaWatch for receiving 2 signals on same band simultaneously.

IC-2330A/H DualBand

Most popular & least used bands combined. One-touch control. 36 memories/band, variable power output, hi-res display.

IC-901 Modular MultiBand



With its options the IC-901 is the world's only 6-band mobile amateur radio. Optional wideband receiver. Fiber optic cabling.

Step 3 Choose ICOM!

Free Brochure Hotline
1-800-999-9877

ICOM America, Inc., 2380 116th Ave N.E., Bellevue, WA 98004

All stated specifications subject to change without notice or obligation. All ICOM radios significantly exceed FCC regulations limiting spurious emissions. MF992

ICOM
Experience the Quality